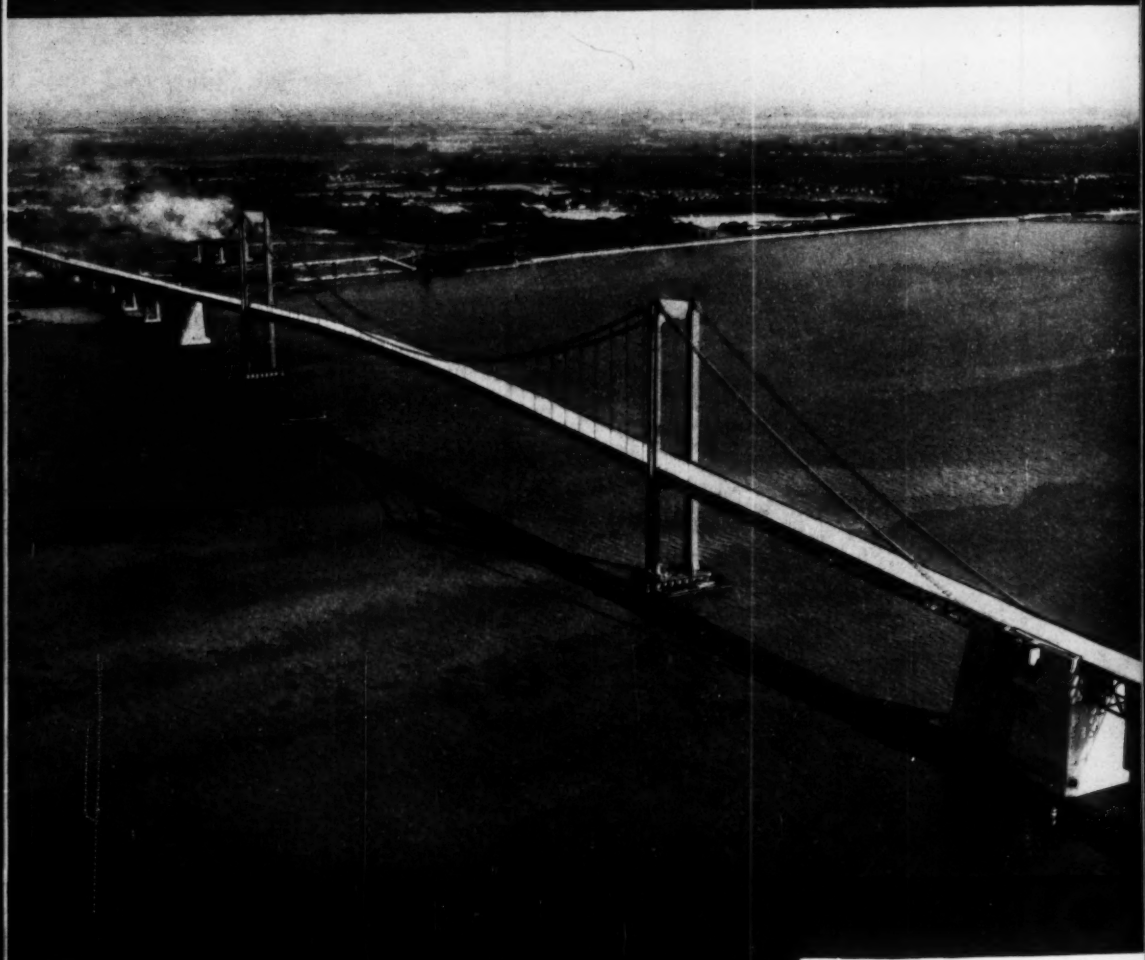
ENGINEERING NEWS-RECORD



A McGRAW-HILL PUBLICATION

Ghosts and buried rain

The spectre of continuing high maintenance expense used to haunt officials of highways, railroads and airports. Usually the underlying cause was unseen and often unsuspected water lurking in the subgrades.

To banish this water permanently and economically, Armco engineers developed HEL-COR Perforated Pipe.

Made on automatic machines, this pipe meets all the needs of a first class subdrainage system. It is low in cost, easy to handle, and durable. It has ample corrugated metal strength to withstand shifting soils, frost action or the impact and vibration of heavy loads. Scientifically placed holes provide controlled infiltration areas to collect unwanted water. Subgrades become dry and stable; maintenance costs go down.

Providing better products to meet specific needs has been standard practice at Armco for more than 40 years. A few examples are Spiral Welded Pipe, FLEX-BEAM Guardrail, STEELOX Buildings and MULTI-PLATE Bridges.

Today you can bring your drainage and construction problems to Armco with full assurance you will receive all the benefits of long experience, extensive research facilities, and a real interest in helping you solve these problems.

Armco has a complete range of engineered products and convenient, authoritative data to help you. If your problem is difficult or unusual, why not talk it over with us.

ARMCO

ARMCO DRAINAGE & METAL PRODUCTS, INC.

MIDDLETOWN, OHIO • OFFICES AND PLANTS IN PRINCIPAL CITIES
SUBSIDIARY OF ARMCO STEEL CORPORATION

Berkeley, California • Middletown, Ohio • South Bend, Indiana • Baltimore, Maryland
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B.F.Goodrich

These tires carry 95 tons over crushed limestone—with ease!

HAULING heavy loads over jagged rock in all kinds of weather calls for tires that can really "take it." Yet this is an everyday occurrence for these B. F. Goodrich Rock tires. The BFG's shown here are used on vehicles that haul limestone and shale from quarry to plant. The total load is 190,000 lbs., of which 88,000 lbs. is pay load.

B. F. Goodrich tires can give this kind of service because they are built to stand up under the most hazardous quarry and construction hauling conditions. For added protection, the patented *nylon shock shield* is built into all B. F. Goodrich tires of 8 or more plies. Extra strong, elastic nylon cords are placed between the tread rubber and the cord body. Under impact, these cords work together, absorbing and distributing the shock evenly. The shock shield protects against bruises and means more recappable tires as well as longer service. Here is a construction advantage which is found only in BFG tires — and at *no additional cost.*

B. F. Goodrich tires are also available in all-nylon construction. For these or any off-the-road tires see your BFG dealer. Or write for additional information on these tires that do a better job at lower cost. *The B.F.Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER

foremost in
WATER MEASUREMENT
and
CONTROL INSTRUMENTS

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Throughout the world wherever precision measurement is required for proper use and control of water, STEVENS instruments have been a standard of quality since 1907.

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Measure deep wells; gage rivers, streams, irrigation ditches and reservoirs; measure sewage flow, assemble accurate permanent records of any liquid surface fluctuation. The STEVENS line is complete in the field of water measurement and control.

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Puts interpretive data at your fingertips. Contains information on float wells and instrument shelters. Complete hydraulic tables. Information on STEVENS water measuring instruments.

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ENGINEERING NEWS-RECORD

ABP Member ABC

Volume 147 AUGUST 16, 1951 No. 7

WALDO G. BOWMAN
Editor

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IF YOU HAVE A REAL ROCK SHOVEL you are equipped for output in any pit!
The Northwest Dual Independent Crowd utilizes force that every other independent crowd wastes! The Cushion Clutch eliminates the effects of shock overloads to parts under power and helps make ample power safer. The Northwest Welded Boom and Dipper Sticks have been proved in Rock work and are built for the hardest job a shovel has to do.
Cast Steel Machinery Bases and Cast Steel Machinery Side Frames take the shocks of rock digging and maintain shaft alignment.
It's a real Rock Shovel and you never have to worry about output at the heart of the job.
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MAKE YOUR KEY MACHINE A REAL ROCK SHOVEL
PROFIT
NORTHWEST
CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

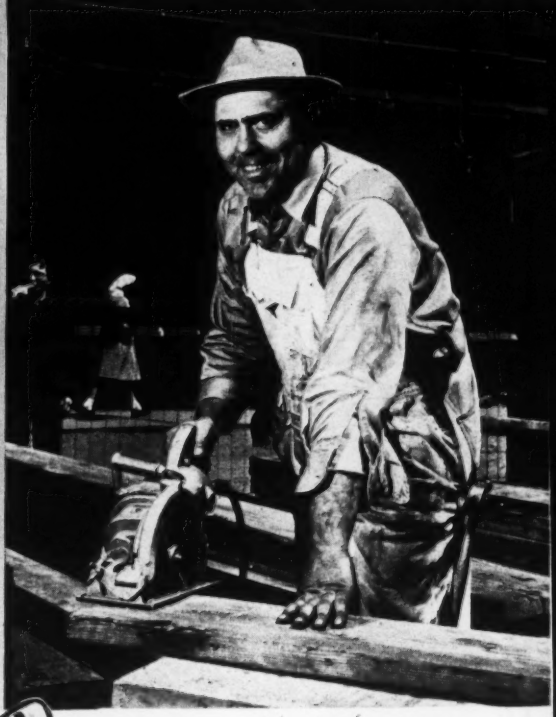
"SKIL BUILDS EASIER OPERATION RIGHT INTO THEIR SAWS,"

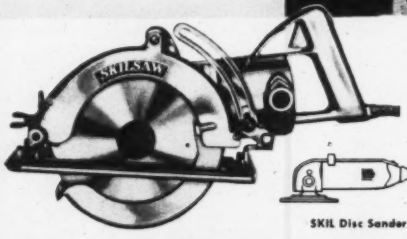
says **BERT HERIC**
carpenter foreman
J. A. UTLEY COMPANY,
Royal Oak, Michigan

"SKIL Saws operate easier even on the heaviest work," says Bert Heric. From handle to blade, SKIL Saws are built to do the most work—continuous work, heavy work—with greater ease for the man behind the saw. SKIL's convenient handling, perfect balance and power-packed performance are "built-in" advantages that have been utilized for over 15 years by the J. A. Utley Company. On their present construction job, the million dollar St. Francis DeSales Church in Detroit, SKIL Saws . . . *only SKIL Saws* . . . are cutting heavy plywood panels and timbers for the foundation and footing forms. "Using SKIL Saws for this heavy work assures us of top performance, low maintenance costs and ease of operation."

"SKIL's rear-grip handle makes these long rip cuts easy," says Glenn Barker. He uses SKIL Saw Model 825 to saw plywood panels for concrete forms. "These cuts are hard work for a saw too, but I've used my SKIL Saw for the job time after time and I know it has power to spare."

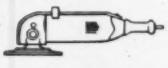
"A SKIL Saw really pushes through the work," says Michael Kadroske. The rear-grip handle provides a straight line of force for easier action and accurate control. That's one-hand operation *in action!* The auxiliary top handle allows the operator to use both hands with convenience and safety whenever he prefers.



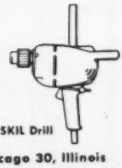


SKIL Saw—Model 825—Powerful, heavy duty 8¼" saw, built to withstand continuous use on large construction projects. Base adjustment: 0" to 2⅛" vertical depth of cut; 0° to 45° bevel adjustment; 2⅛" depth of cut at 45°. Free speed of blade: 3000 r.p.m. Overall length: 18". Weight: 17¼ pounds.

SKIL
PORTABLE TOOLS

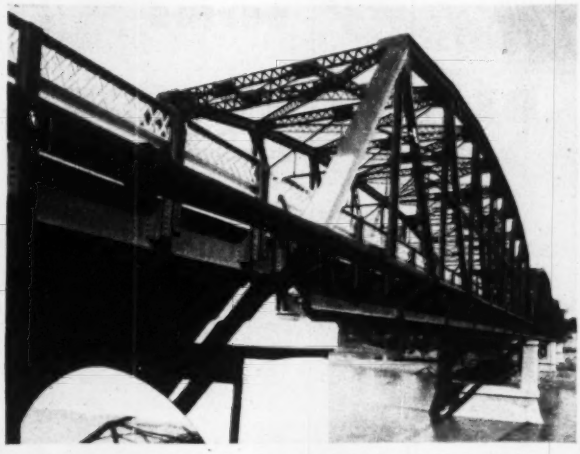

SKIL Disc Sander

SKIL Belt Sander


SKIL Drill

SKIL Products are made only by SKILSAW, INC. 5033 Elston Avenue, Chicago 30, Illinois
SKILSAW Factory Branches in principal cities In Canada: Skiltools, Ltd., 3601 Dundas Street West, Toronto 9, Ont.

Got EXPANSION-CONTRACTION problems in the pipeline you're designing?

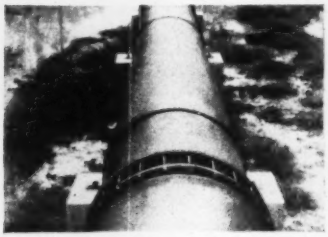


A 16" Dresser-Coupled water line across the Colorado River at Grand Junction, Colorado. Dresser-Coupled to assure Flexible-Tightness despite longitudinal stresses and traffic vibrations that would open a rigid line. Easily installed Dressers have given dependable service here since 1933.

Provide an economical solution to expansion-contraction troubles in your pipeline plans. Specify a Dresser-Coupled steel line. Dresser Couplings are designed to absorb longitudinal stresses that spring leaks and build up maintenance costs on other lines. Dressers can be installed in minutes, using only a wrench, and no special skill is needed. And once installed, you have a permanent, "Flexible-Tight" line that gives years of virtually maintenance-free service.

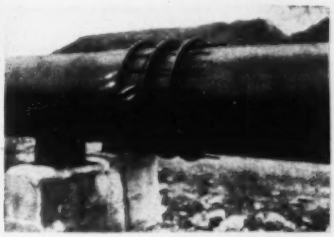
Dresser Couplings on every joint eliminate the need for expansion joints. However, for lines subject to extreme longitudinal stresses Dresser Expansion Joints are your best solution. They're field proved for many years on oil, gas, water, gasoline, low-pressure steam, and other piping . . . and they're economical . . . easy to install.

Mail the coupon below for detailed information on Dresser Expansion Joints . . . and engineering reports on recent Dresser Coupling installations.



A section of Savannah's new 42" Dresser-Coupled water line crossing swampy ground on concrete pile bents. Flexibility of couplings protects line against stresses.

Another Dresser-Coupled installation in Chicago, Ill. Dressers harmlessly absorb underground stresses beneath city streets where joint failures would be extremely costly.



Style 63 Dresser Expansion Joint—one of 4 types available to accommodate pipe movements up to 10" and more. Efficient, well-proved, and economical for most all types of lines.

DRESSER

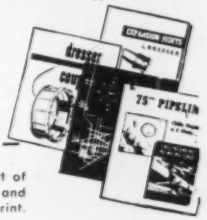
"FLEXIBLE-TIGHT"

COUPLINGS

Dresser Manufacturing Division,
319 Fisher Avenue, Bradford, Penn-sylvania
(One of the Dresser Industries)

GET THESE FOLDERS NOW!

Interesting engineering data on varied types of lines installed with Dresser Couplings. Also Expansion Joint Catalog. This is file material.



Gentlemen: Please send me your "Report of Dresser-Coupled Lines", Expansion Joint and Style 38 Catalogs and "Bridge River" reprint.

Name_____

Firm_____

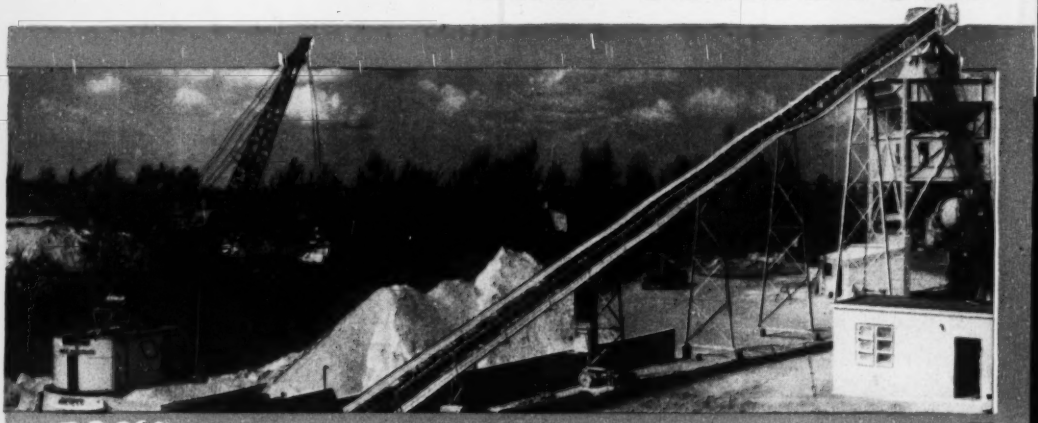
Address_____

City_____ Zone_____ State_____

Barber-

B-G Redi-Fab series

BELT CONVEYORS



EASY **SELECTION FROM CATALOGED UNITS**

Experience has shown that most of your belt conveyor requirements are met by units that form a specific segment of the vast Barber-Greene Conveyor line. That segment is the Redi-Fab series—the conveyor sizes you most frequently need. These conveyors have been separately and conveniently cataloged in a wide variety of small increments of width, length and horsepower. Redi-Fab series components—truss sections, drives, takeups, power units, terminals and complete accessories—are "packaged" for all-the-shelf delivery.

FAST **QUOTATION, DELIVERY, ERECTION**

Actually, you can select your Redi-Fab Conveyors, and order the proper components, directly from Catalog RF—an entirely new approach to conveyor selection. Better still, work with your B-G distributor representative. Without costly time-consuming engineering, you can choose the conveyor that exactly meets your needs. Quotation and delivery are faster because you select from standard, pre-built units normally available from distributor or factory stock. Erection is simpler—all units are delivered clearly marked for fast, easy assembly.

NOW More than ever, machines must be used most effectively. Redi-Fab Conveyors offer the fast, sure way to release shovels, cranes, tractors and the like for more productive work — to minimize manpower requirements and increase productivity. Send for your copy of Redi-Fab Catalog RF.

see your B-G distributor

Greene

"PACKAGED" UNIT CONSTRUCTION

HERE ARE TYPICAL REDI-FAB PACKAGES...

Foot End—available factory-assembled, or in "packaged" components

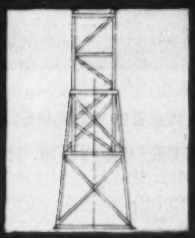
Head End

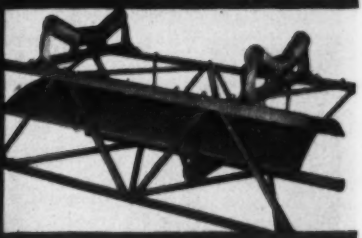
Intermediate Section—panel package, frame package and carrier

Redi-Fab "packages" are logical, convenient groups of parts—or factory-assembled components packed or bundled for individual shipment. This saves shipping costs, simplifies stocking, ordering, erection and future alterations.

All packages are clearly marked for easy assembly. All the engineering has been done at the factory. Your Redi-Fab Conveyor can be assembled quickly by a few semi-skilled men.

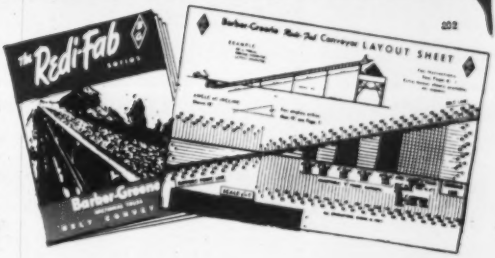
WIDE CHOICE OF COMPONENT EQUIPMENT & ACCESSORIES



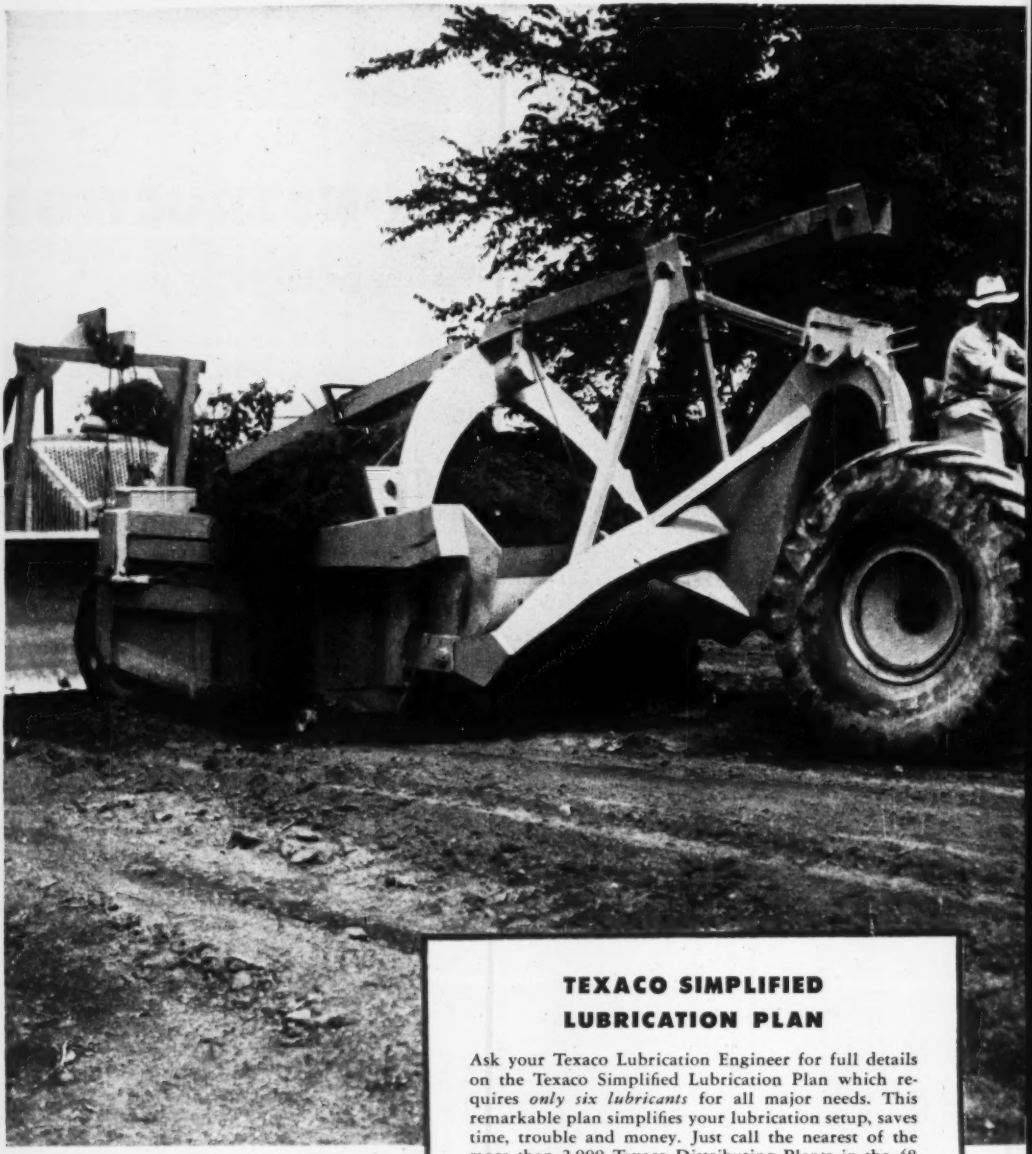


send for Redi-Fab catalog

The new 40-page catalog makes it simple for you to figure your own conveyor requirements if you wish. No knowledge of horsepower required. The catalog makes possible the proper selection of the conveyor with the correct size of drive and motor. In fact, with the new layout sheet in the Redi-Fab Catalog, you can make your own layout—accurately, down through all details including locating the A-frame supports. Write for your copy, or ask your B-G distributor.



BARBER-GREENE COMPANY
AURORA, ILLINOIS, U. S. A.



TEXACO SIMPLIFIED LUBRICATION PLAN

Ask your Texaco Lubrication Engineer for full details on the Texaco Simplified Lubrication Plan which requires *only six lubricants* for all major needs. This remarkable plan simplifies your lubrication setup, saves time, trouble and money. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO

FROM EVERY ENGINE— DEPENDABLE POWER

AT LOWER COST

...when you lubricate with TEXACO URSA OIL X★★

TO KEEP your machinery on the job and out of the repair shop, lubricate all Diesel and heavy-duty gasoline engines with *Texaco Ursa Oil X★★*. Detergent, dispersive *Texaco Ursa Oil X★★* prevents carbon, gum and sludge . . . stands up under heat and pressure . . . gives bearings full protection against wear and corrosion, even under severest operating conditions. Result — powerful, dependable performance . . . less down time . . . fewer repairs.

Cost-saving *Texaco Ursa Oil X★★* keeps rings free and ports open for better compression and combustion. Fuel consumption is reduced, parts last longer and maintenance costs drop. Operators everywhere report more reliable and economical engine performance, thanks to *Texaco Ursa Oil X★★!*

For savings in chassis lubrication, use *Texaco Marfak*. Its tough, adhesive protecting film assures greater protection for longer periods between overhauls. *More than 400 million pounds of Texaco Marfak have been sold!*

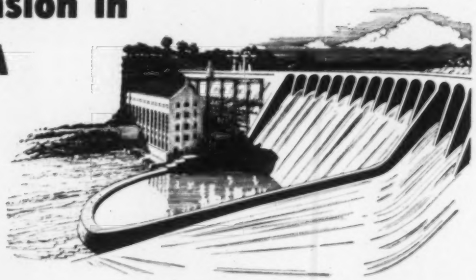
In wheel bearings, use *Texaco Marfak Heavy Duty*. It seals itself in the bearings and seals out dirt and moisture, won't leak onto brakes . . . requires no seasonal change.

Crawler track mechanisms run better, last longer when protected with *Texaco Track Roll Lubricant*. Better protection against moisture, dirt and wear under all operating conditions.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Why ALABAMA POWER COMPANY is Spending $100,000,000 for Expansion in ALABAMA



Thomas W. Martin, Chairman of the Board of Alabama Power Company, recently announced a record-breaking three-year program of expansion of $100,000,000.

In a statement announcing the decision of the Company to spend this unprecedented sum for new construction, Chairman Martin said:

"No region in America has matched the Southeast's dynamic progress in the past two decades. The Southeast has outgained all sections of the nation in percentage of increase in per capita earnings and is now being generally acclaimed as the region of tomorrow's greatest opportunities for growth.

"Birmingham is the central city of the Southeastern States. It has outstanding manufacturing and distributing advantages for companies that are decentralizing, manufacturers that are broadening production, and firms which wish to put sales offices in the center of the growing Southeast consumer market. Among these are abundant raw materials and labor, a web of transportation facilities, low-cost fuels and power, and a most reasonable tax rate.

"Birmingham and Alabama have experienced their greatest industrial development in the postwar period. Studies made by our Company forecast continuation and acceleration of this progress in the period ahead. This is why we estimate the expenditure of more than $100,000,000 over a three-year period for expansion of our Company's facilities in Alabama."

* * * * * * * *

The Committee of 100 or any of the undersigned members of the Executive Committee will welcome the opportunity to give you confidential and specific data regarding the advantages of the Birmingham district for your plant, office or warehouse.

BIRMINGHAM COMMITTEE OF 100

Executive Committee

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State of Alabama

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Tennessee Coal, Iron & Railroad Co.

NEWS BRIEFS

• **Slot machines into scrap**—The Ohio Liquor Department, which had in its possession 295 confiscated slot machines, recently hit the jackpot using road rollers borrowed from the Ohio Highway Department. Faced with the problam of disposing of the slot machines, the department dismantled them. At the state garage they were rolled into scrap for salvage. But first the deposit boxes, containing coins, were turned over to the state.

• **No more poison ivy?**—Poison ivy which has been the cause of a great many lost man-hours among maintenance forces of the Pennsylvania Department of Highways may soon be eliminated from roadsides under a program now being carried out. District highway foresters have been provided with more than 360 gal of a herbicide consisting of a combination of 2 4-D and 2,4,5-T with which they are now spraying young and old growth poison ivy. Many sprayed areas have shown almost a hundred percent kill within a week following an application. Spraying is done within highway rights-of-way on other noxious weeds such as Canada thistle, horse nettle, wild mustard, ragweed, common mullein, wild chickory and pokeweed.

• **Fast concrete work**—What is believed in Ohio to be the fastest concrete road-laying job on record was set by V. N. Holderman and Sons, Inc., Columbus, in the construction of the two north lanes of U. S. 40 to make a 4-lane superhighway for a distance of 11.5 miles west of Zanesville. The job was started on May 4 and completed July 3. Equipment used consisted of two concrete spreaders, two finishers, two longitudinal finishers, two dual drum pavers, and one spraying machine. On the last day of the project 4,260 ft of a 12-ft wide lane were laid. Though the entire job was in record time, in no single day was the contractor able to equal his record-breaking feat of 1950, when he put down 4,700 ft of an 11-ft lane in a single day, on Route 224 between Newcastle and Dover, Pa.

• **Halogeton, the weed**—Poisonous to sheep and other farm animals, was found to cover a large highway department gravel pile of the Montana State Highway Department. Ten miles away, a smaller gravel stockpile was also discovered with the weed. And then there were the roads covered with the gravel. The highway department is busy spraying this "natural

(*Continued on page 15*)

Raymond

MAKES 5 TYPES OF CONCRETE PILES

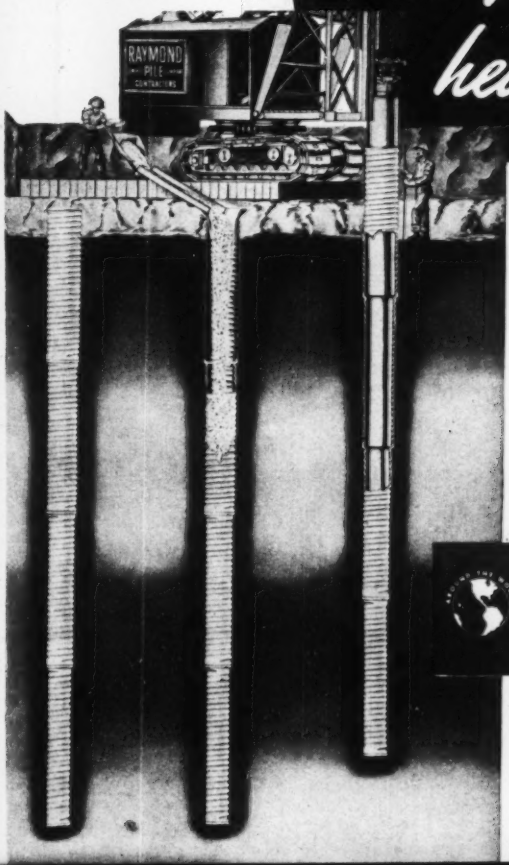
1. STANDARD . . . 2. STEP-TAPER . . . 3. PIPE STEP-TAPER

4. COMPOSITE . . . 5. GOW CAISSONS

Raymond installs every type of pile: cast-in-place concrete, precast concrete, steel pipe, wood and H-beam. Raymond operations include underpinning, borings and soil investigations, waterfront construction and harbor and river improvements, and cement mortar lining of oil and water pipe lines 4" to 144" in diameter by the Centriline Corporation, a Raymond subsidiary.

2. STEP-TAPER PILES FOR *long lengths* WITH *heavy loads*

At left, completed Step-Taper Pile. Center, filling the permanent steel shell with concrete after internal inspection. Right, driving the pile with rigid core.



Raymond Step-Taper Concrete Piles driven with rigid steel cores and heavy hammers are designed to develop high load-carrying capacities at depths to 80 feet. The permanent steel shell maintains the resistance developed during driving. After the shell is inspected internally, it is filled with concrete and cut off at the specified elevation.

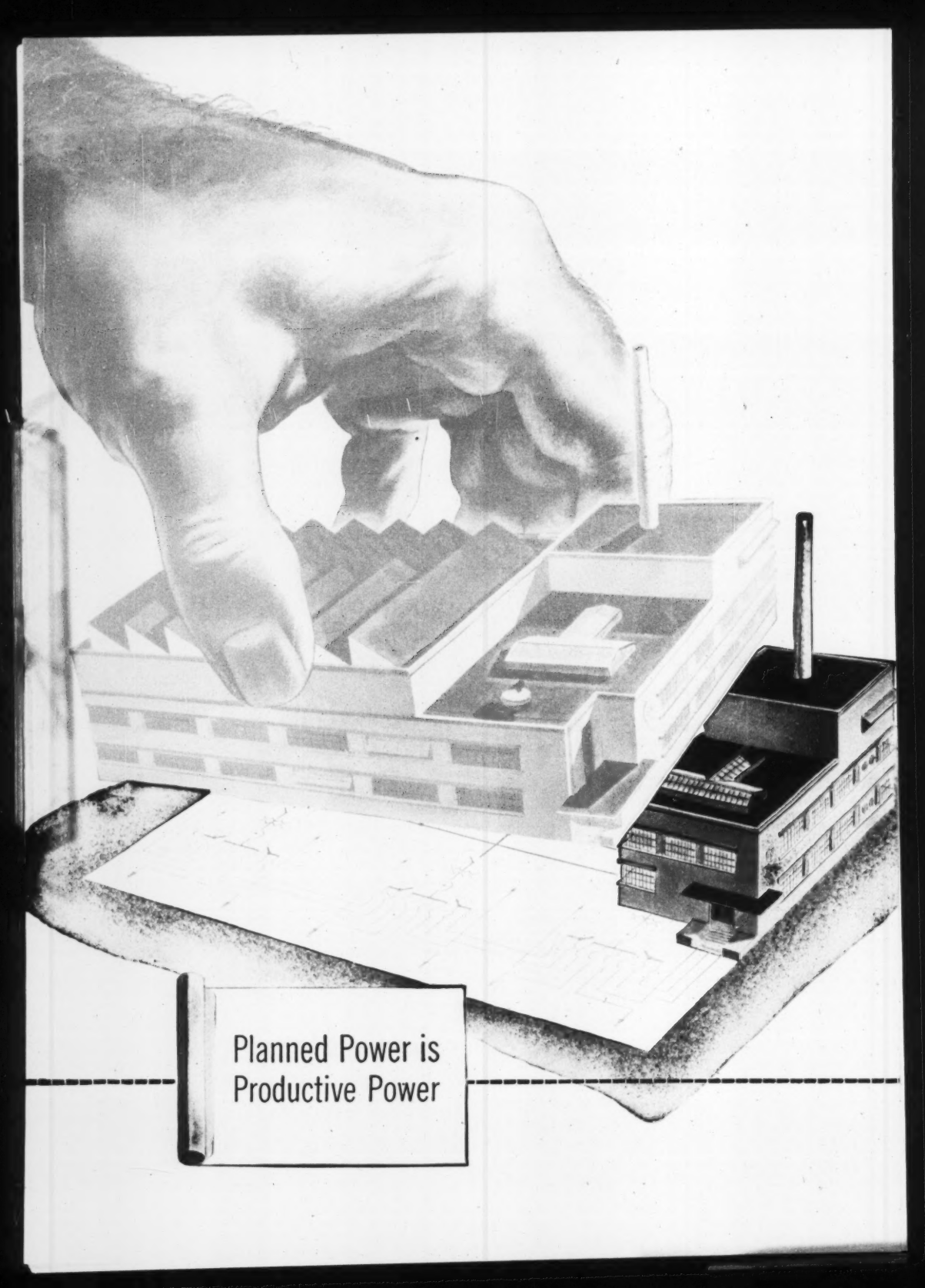
You are invited to discuss with our engineers the efficiencies and savings made possible by Raymond's exclusive, original concrete pile designs.

◀ RAYMOND PILES MAINTAIN DRIVING RESISTANCE

Raymond CONCRETE PILE CO.

140 CEDAR ST., NEW YORK 6, N. Y.

BRANCH OFFICES: Boston, Syracuse, Philadelphia, Baltimore, Washington, Pittsburgh, Atlanta, Miami, Houston, Kansas City, St. Louis, Cleveland, Chicago, Detroit, Salt Lake City, Portland, San Francisco, Oakland, Los Angeles and principal cities in Latin America.


Planned Power is
Productive Power

Prepare

for growing loads...

Plan Your Power First

A pre-planned power distribution system is the best protection against groaning electrical circuits. The increased loads that are sure to come will be handled easily if the electrical requirements are figured *now* . . . in the basic planning stage. Save yourself the cost and trouble of hit-or-miss electrical patching.

Maximum productive efficiency goes hand-in-hand with modern plant distribution systems. It takes dependable power to deliver the results of skillfully engineered production lines. As the production lines expand, the power must match the pace. Selection of the one best planned system for your plant will bring you the expansion "insurance" you need.

You benefit from planning your system in advance and by using Westinghouse-engineered equipment. For, our engineers make a business of planning systems, of designing equipment to work together. This unit engineering responsibility paves the way for easier planning for you. Here's what Westinghouse can bring to your plant:

Greater Reliability . . . No weak links in your system. All equipment tested and engineered by one responsible source. You get the right unit for the right job.

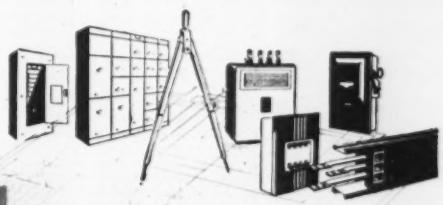
Greater Flexibility . . . Your system will expand easily to meet growing loads. Added equipment is an integral part of the basic system—not just hastily tacked on stopgaps.

Greater Simplicity . . . Efficient, space-saving equipment means fewer and safer connections to make, fewer units to maintain.

Tap the extensive Westinghouse system planning facilities. You'll get the most out of your power, the most out of your plant. Call your nearest Westinghouse Office or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-94889

An Excellent Aid to Distribution System Planning

B-4045 contains fact-filled pages and color diagrams completely explaining the 11 basic systems used in industry today. This booklet will provide a specific answer to your power distribution problems.



YOU CAN BE SURE.. IF IT'S

Westinghouse

SYSTEM PLANNING

Less Infiltration

TRANSITE* SEWER PIPE offers two basic safeguards that minimize infiltration in sewer lines: *tighter* joints and *fewer* joints.

Transite's special sleeve-type joints make up tight and stay tight in service.
Its long 13-foot lengths reduce the number of joints in the system.

These safeguards cut down the volume usually allowed for infiltration, reducing sewage load on the treatment plant and conserving plant capacity for future needs. Where new treatment facilities are planned, this reduced infiltration may permit consideration of a smaller plant with resulting economies.

Other Transite Economies—Transite's long lengths help maintain uniform grades; fewer joints reduce turbulence in the line. These advantages, added to Transite's unusually smooth interior, mean better flow qualities (Kutter's n=.010). This often permits designing the system with flatter grades and shallower trenches. Or, as an alternate economy, pipe of smaller diameter may be specified.

Transite Sewer Pipe is made of asbestos, cement and silica by a special manufacturing process that employs steam curing to develop greater corrosion resistance and strength. It is available in four strength classes in sizes to 36", permitting selection of the pipe best suited to trench conditions, and frequently eliminating the need for concrete cradles.

For further details, write Johns-Manville, Box 290, New York 16, N. Y.

JM

*Transite is a Johns-Manville registered trade mark

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TRANSITE SEWER PIPE...

Briefs . . .

error" which is so difficult to spot by non-experts in weedology.

• **Office space scarcity**—Because not a single office building is under construction in Boston, Mass., office space is becoming scarce there, with most of the choice locations having a 100 percent occupancy. Lack of this type of construction is caused by the ban that has been placed on building of a non-essential character by the National Production Authority.

• **New Jersey on the scales**—New scales in three units to be installed on the New Jersey state highway system.

The Cover

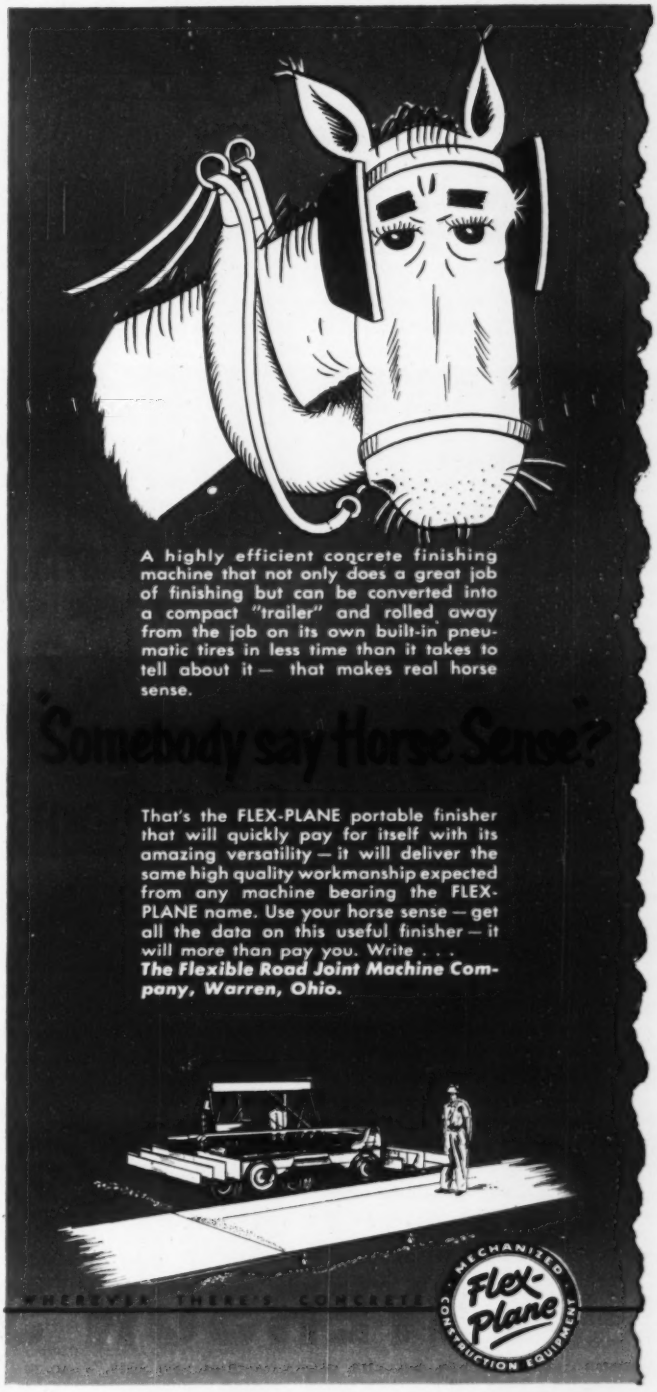
There's probably the fastest paving job in history (20 minutes for 2.04 miles of roadway) involved in ENR's cover picture of the Delaware Memorial Bridge.

When the airview of the graceful, $44-million suspension span was taken, the roadway had been paved only in alternating sections, and the deck-area had a lot of machinery on it; an erection derrick graced the top of each tower.

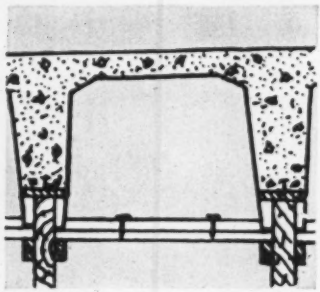
This would never do for a picture that was to be printed on the day the bridge was thrown open to traffic—but time and the printing schedule wouldn't allow any further delay while the concrete workers finished their jobs. So, ENR's art department stepped into the breach, paved the road and removed the construction equipment at the swish of an air-brush.

Quick-paved or not, the bridge contains the world's sixth largest suspension span, with a center span of 2,150 ft.; has side suspended spans of 750 ft each; carries four lanes of traffic on 61 ft of roadway; has towers 442 ft above mean low water. Entire length of the project is 3½ miles, and includes 33 plate-girder spans, 10 truss spans. The structure provides a link to New Jersey's Turnpike—thus speeds up coastwise traffic—and also provides quick connections between the New Jersey and Delaware communities bordering the river. (ENR Jan. 19, 1950, p. 36).

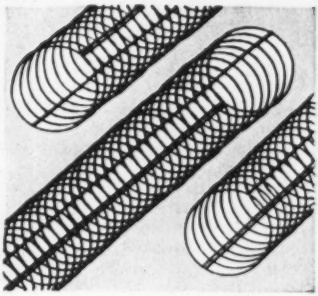
Built by the Delaware Crossing Division of the Delaware State Highway Department, engineers were Howard, Needles, Tammen & Bergendoff; O. H. Ammann was consulting engineer; A. Gordon Lorimer, was consulting architect, and Moran, Proctor, Freeman & Mueser were consultants on foundations.


A highly efficient concrete finishing machine that not only does a great job of finishing but can be converted into a compact "trailer" and rolled away from the job on its own built-in pneumatic tires in less time than it takes to tell about it — that makes real horse sense.
Somebody say Horse Sense?
That's the FLEX-PLANE portable finisher that will quickly pay for itself with its amazing versatility — it will deliver the same high quality workmanship expected from any machine bearing the FLEX-PLANE name. Use your horse sense — get all the data on this useful finisher — it will more than pay you. Write . . .
The Flexible Road Joint Machine Company, Warren, Ohio.
WHEREVER THERE'S CONCRETE
MECHANIZED
Flex-Plane
CONSTRUCTION EQUIPMENT

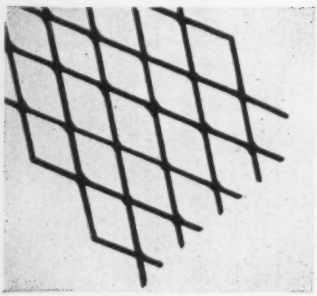
WIRE ROPE



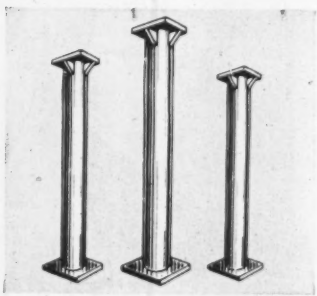
STEEL FORMS for concrete joists



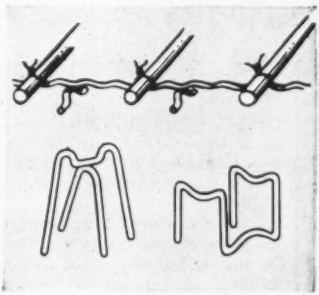
REINFORCING SPIRALS



EXPANDED METAL



LALLY COLUMNS



REINFORCING ACCESSORIES

Construction Steels for Prompt Shipment from Stock

Did you know that your nearby Ryerson plant is a time-saving source for the products pictured above? And that, right now, Ryerson stocks of all these products are "fairly good to excellent"? Most are on hand in several types and a wide range of sizes.

Ryerson construction steel experts are ready for your call at each of thirteen strategically located plants. You can count on them to give your requirements special attention and prompt, accurate handling.

Your nearby Ryerson plant is also a convenient source for many other construction steels, but, of course, today some shortages are inevitable. However, call us for any steel requirement and we'll do our level best to help you.

RE-BARS FOR FUTURE DELIVERY

Do you have a construction project that's not scheduled to start for a few months? If you have, it will pay you to order reinforcing bars now for future delivery. Jobs already in work will take most of our stocks during the rest of this year. But we are currently accepting reinforcing bar orders for delivery early in 1952. We suggest that you place your order now so that material will be available when needed.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC.—STEEL SERVICE PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST LOUIS • LOS ANGELES • SAN FRANCISCO

THE CONSTRUCTION WEEK

Contracts by type of work

	This Week	Cumulative 33 wks— 1951	1950	% chge
Waterworks	$2.1	$139.9	$141.7	−1
Sewerage	5.5	205.4	158.9	+29
Bridges	8.1	212.1	241.1	−12
Highways	15.9	751.7	836.3	−10
Earthwork, Waterways	4.1	350.1	303.4	+15
Buildings:				
Public	41.5	1,503.4	1,046.2	+44
Housg., pub.	4.7	545.0	184.0	+196
Housg., priv.	34.2	1,245.5	2,229.6	−47
Commercial	10.6	442.1	621.6	−29
Industrial	69.5	2,749.4	798.3	+244
Unclassified	18.8	1,216.4	802.1	+52
Total	**$215.0**	**$9,361.0**	**$7,463.6**	**+25**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR COST INDEX

Index Base = 100		1913	1926	1949
Constr. Cost.	Aug. '51	542.78	260.91	113.78
Bldg. Cost	Aug. '51	400.07	216.26	113.72
Volume	July '51	665	270	192

(Other business news on p. 98)

ALL BUT ONE—James K. Knudson, Defense Transport Administrator, started last fall to get state highway departments to lift their basic load limits, but relaxed his efforts in that direction after one of his men had gone to see what was happening to the Maryland Test Road (ENR Jan. 18, p. 28). Then he began asking the states to issue permits for essential over-size and over-weight loads. Forty-seven highway departments have agreed, provided the permits are limited to items which cannot be carried by dividing up loads. DTA declined to name the lone holdout, but officials say it is the same state that refused to make a similar arrangement with the Defense Department for military traffic. Military officials say it is New Jersey.

RESPITE FOR MANUFACTURERS—Office of Price Stabilization last week postponed indefinitely the filing date for Form 8 for manufacturers, calling for detailed ceiling price data for each manufacturer, under CPR 30 and CPR 22. Filing previously had been required by Aug. 13. OPS presumably wants to wait until it can get out new regulations that take into account the Capehart cost-plus amendment. Equipment and materials producers will gain a short breathing period while they await new orders.

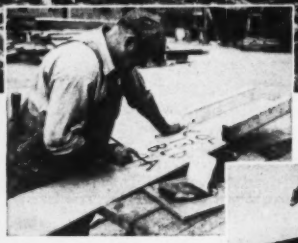
FORGOTTEN MEN?—State and municipal government officials feel they are being sidetracked by the mobilization program. Collectively they conduct a $9-billion business annually, but have a tough time convincing mobilizers of their need to operate. They claim a two-fold problem: (1) They must assist the defense program; (2) they must procure materials and supplies to maintain normal operations. But salesmen are staying away from seats of government and factories are refusing their orders. The reason: There is no priority protection for their orders.

GUESS WHO, IN CALIFORNIA—Latest game in California is trying to guess who will be the next public works director, to succeed Charles H. Purcell, resigned (ENR Aug. 2, p. 28). If an engineer is named, as urged by engineer groups, chances are it will be one of these: Ralph Tudor, San Francisco consulting engineer; G. E. Morris, director of the Los Angeles Building Department; or G. T. McCoy, state highway engineer.

BOOMERANG—An unexpected result of the recent Ohio Supreme Court ruling holding up public housing in that state, by virtue of an adverse decision on constitutionality of a state law granting tax exemption to public housing (ENR July 26, p. 30), is the blocking of a voter-approved $39-million innerbelt expressway for Columbus, Ohio. The new freeway is engineered to pass through low-value residential districts. But if the persons living in these blighted districts cannot be displaced by moving them into public housing projects, the highway cannot be built.

LEADER KEEPS THE PACE—Pennsylvania has set a fast pace in superhighway construction. Not content with its program of completing a continuous turnpike across the entire state from east to west, the legislative House recently authorized construction of a northeastern extension—from a point on the present eastern extension to the New York border between the Delaware and Susquehanna rivers. The bill went to the Senate.

Saved: $1.44 PER CU. YD. OF CONCRETE



Forms for Astoria Houses, Section 2, designed and engineered in the office and built to closest tolerances, moved up at speed equal to or exceeding that of any other type of construction. Good job planning made fullest use of dependable 'Incor' high early strength. Result, 60 days' earlier completion—NET saving, $1.44 per cu. yd. concrete.

92 Floors and Roof Slabs Concreted in 98 Working Days

●

● New York City Housing Authority plans and builds with a single objective—full value for every dollar—using reinforced concrete frame construction for utmost stability and fire-safety, maximum speed and economy.

General Contractor planned the 12 buildings in Section 2 of Astoria Houses to go up at the same time, but, due to unforeseen foundation conditions, went ahead with six buildings, using 'INCOR' 24-HOUR CEMENT with one set of forms for each building, then re-used these forms on the other six.

Well-engineered forms, designed in the office and built to closest tolerances, were a key factor in streamlined efficiency—erection speed equal to or exceeding that of any other type of frame erection.

First floor poured June 19, 1950 . . . last roof slab of twelfth building on November 1, 1950 . . . *80 floors and 12 roof slabs, 15,000 cu. yds. of concrete, in 98 working days . . . completed before cold weather!*

Dependable 'Incor' early stripping strength kept the job on rapid schedule, saved over 60 days. Result, $1.44 NET saving per cu. yd., over and above the 73¢ a yard extra cost of 'Incor'. Cold-weather saving was another big plus.

'Incor' economy knows no season. Right around the calendar, 'Incor'* promotes smooth-running, time-saving efficiency on which today's close-margin profits depend. Send for illustrated booklet, 'Cutting Concrete Costs'—write Lone Star Cement Corporation, 100 Park Avenue, New York 17.

*Reg. U. S. Pat. Off.

NEW YORK CITY HOUSING AUTHORITY
ASTORIA HOUSES—SECTION TWO
(12 Buildings), Astoria, Queens, New York City

Architects:
HARRISON, ABRAMOVITZ & WIGGINS, New York
Engineers: **SEELYE STEVENSON & VALUE,** New York

Ready-Mix 'Incor' Concrete:
COLONIAL SAND & STONE CO., INC., New York

General Contractors:
WILLCOX CONSTRUCTION COMPANY, Inc.
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TOLL ROADS EASE HIGHWAY FINANCING

Toll highways are staging a comeback. Some of those already built are being extended, others are under construction or in the planning stage. And many state legislatures which until recently wouldn't even consider charging tolls are giving serious thought to getting into the toll road act.

The trend appears to be the result of a combination of needs for new express highways and a general inability to finance them by ordinary methods.

• **Huge needs**—Highway traffic is growing so fast today that road building must continue at 1950's record levels just to keep up with the expanding demand.

Traditional financing probably can handle that amount of building. But funds for highway work—as they are being used today—are inadequate to take care of the huge backlog of needs left over from wartime neglect of the roads. That backlog has been estimated at between $40 and $60 billion.

A lot of the backlog is in badly needed express highways for the most heavily traveled routes. At the present rate of spending on these highways, it would take an estimated 100 years to bring the vital 37,000-mile National System of Interstate Highways up to the standards set for that system.

That's where tolls come in. A mere 1% of U. S. street and road mileage carries 15% of total traffic and a much higher percentage of truck traffic. And heavy traffic, especially truck traffic, has been found to be the key to successful financing by tolls. Where reliable traffic studies have shown that there will be sufficient traffic to provide an adequate return, some of the states have found it possible to issue revenue bonds to finance road construction, without making any change in constitutional debt limits. By such borrowing, they have been able to get money for an addition to their trunk highway system without taking a cent away from their regular road and highway work.

With these advantages—and with needs for express roads so great—more and more states are turning to toll financing for special projects. The Brookings Institution reports 424 miles of toll highways now operating in the U. S., with 250 miles under construction and 1,198 additional miles authorized.

• **Tolls paying off**—The Pennsylvania Turnpike is the best known of the toll roads. It is not part of the postwar movement, having been opened to traffic in 1940. But it's a good example of how financing by tolls can work out.

The turnpike had one financial advantage not enjoyed by more recent projects—part of the original road was paid for by PWA, and the RFC added a loan of $40.8 million dollars. But all additional construction has been financed by revenue bonds. By 1950 there were more than $211 million dollars in bonds outstanding. That's a staggering debt for one road to carry—yet revenues in 1950 exceeded operating, maintenance and interest costs by more than $5 million dollars. Net revenues are expected to be much higher in later years.

Financial figures for other toll roads aren't nearly so striking—but those other roads are not as long as the Pennsylvania Turnpike, and some were built at much higher cost in the postwar period. But their financial records are good. The Maine Turnpike, after running a deficit in 1948, its first year of operation, earned nearly double its interest obligations in 1950. Westchester County, N. Y., Parkways earned $600,000 over operating costs and debt service charges in 1949.

• **The outlook**—**Toll roads aren't going to solve the U. S. highway problem by themselves—they are only helpful where extra-heavy traffic can pay the high cost of financing, construction and toll collection. But the increasing popularity of the toll-financing method is helping to get some badly needed express highways. This trend may continue until densely populated states catch up on accumulated needs.**

MARLOW pumps relied on for United Nations construction project!

This group of dependable Marlow Self-Priming Centrifugal pumps helped Fuller-Turner-Walsh-Slattery construction companies keep huge United Nations building project on schedule. Experienced construction men everywhere avoid trouble and protect profits with the pumps that can't be beat for staying power . . . MARLOW pumps.

REMEMBER! Marlow pumps prime faster, pump more, last longer and for over a quarter of a century have been the accepted standard of the industry. Let Marlows help you, too.

Write for information and name of nearest dealer

MARLOW PUMPS

510 GREENWOOD AVENUE • RIDGEWOOD, N. J.

Manufacturers of the World's Most Complete Line of Construction Pumps

Competitors cooperate in research

THE WAY A RESEARCH PROJECT is handled sometimes is more significant than the research itself.

On page 43 we report an industrial-waste research in which each of three competing chemical companies used the same testing facilities and the same wastes to investigate the treatment effects of its own product on phenol wastes. Published test results compare performances of the three rival products objectively, giving the customer a basis for choosing the product that suits his waste conditions best.

The significant thing here is that the competitors worked in such close harmony.

Here is how they happened to get together: The Ohio River Valley Water Sanitation Commission recognized need for the project, obtained the cooperation of the companies, directed the research and released the report.

Credit is due to both the commission's leadership and to the selflessness of all who participated. Any one of the group, working by itself, might never have generated such useful data. More of such cooperation would do much to speed progress in the still largely unexplored field of industrial waste disposal.

CIO flood control

A SOLUTION OF THE FLOOD PROBLEM of the Missouri River basin has been laid before President Truman by Philip Murray, president of the Congress of Industrial Organizations. He proposes immediate creation of a President's Emergency Commission that would: "Fix upon a series of reservoir sites which will do their part in the flood-control job with the least possible damage to farms, homes, soil, forests, wild life, recreation, scenery and minority (Indian) rights. Such sites should be looked for, in general, on tributary streams, not the main stem.

"The fantastic Pick plan for navigation on the lower River—for which there is not enough water in the entire valley despite the floods—should be abandoned."

Mr. Murray goes on to advocate immediate action on the water storage feature of a bill sponsored by the Department of Agriculture that "contemplates construction of some 16,000 small upstream check dams and a multitude of farm ponds, terraces and the like which will hold back millions of acre-feet of flood waters every year."

There—in a nutshell—is the long sought solution for the flood problem of the Missouri River Valley!

And for the benefit of those who may wonder why so little progress has been made to date towards a solution, Mr. Murray contributes the following:

"The main thing which has stood in the way of effective flood control on the Missouri River has been the discredited Pick-Sloan plan. Wrong in purpose and wrong in method, this so-called plan would do so much damage that the people of the valley have been up in arms against it."

Should it happen that engineers employed by the proposed President's Emergency Commission find that reservoirs on the tributaries are far above the areas of greatest rainfall concentrations, or that the most desirable reservoir sites will do so much "damage to farms, homes and soil," that the local people will be "up in arms" against building reservoirs on those sites, or that storage needed for hydro power cannot be used for flood storage, Mr. Murray probably will advise the commission to discard such short-sighted findings along with the Pick-Sloan plan.

But why employ engineers? They have a way of digging up hard and unpleasant facts that confound the sweeping plans of the armchair specialists.

Can rainmakers check floods?

USING RAINMAKERS to check floods has been suggested as a possibility by Vincent J. Schaefer, the scientist who directed the pioneer cloudseeding operations of the General Electric Company. Speaking at a meeting of the Great Plains Agricultural Council in Laramie, Wyo., Mr. Schaefer urged the farmers in semi-arid regions to encourage rainmaking experiments as a means for gaining fuller knowledge of the possibilities of seeding clouds with silver-iodide particles or dry ice.

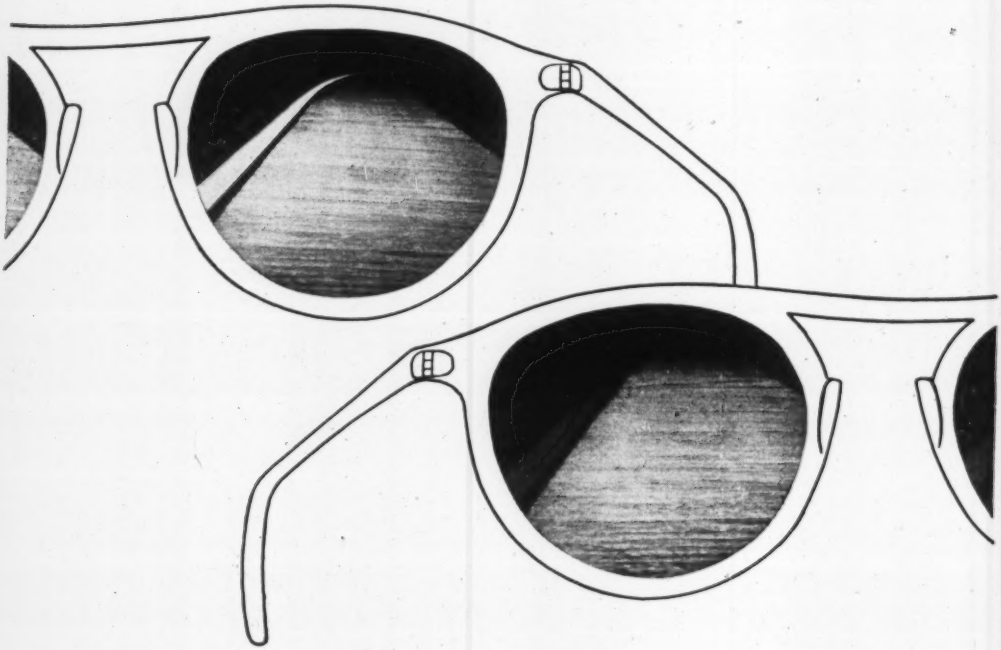
Certainly there is challenge in the thought that the clouds that poured rain across the already saturated fields and into the overflowing streams of the lower part of the Kansas River valley in the recent flood could have been made to drop their water in parts of Colorado where the present scant rainfall needs to be supplemented to make the land fully productive. But our present knowledge of rainmaking is much too limited for us to do more than speculate as to the possibilities of such a proposal.

That lack of knowledge gives special force to views expressed at the Laramie meeting by Harry Wexler, head of the Weather Bureau's research division. Mr. Wexler said that unless commercial rainmakers leave control areas untouched by their operations and make full reports of results obtained in areas where they are operating, it will not be possible to make scientific determinations of the possibilities of these new methods for increasing precipitation. We have yet to learn how rainmaking in one area affects an adjoining area.

Ability to increase rainfall in one region and reduce it in another could do much toward ending droughts and cutting flood damage, but before we can attempt that with confidence we must have vastly more factual information than we have today.

Which curb would you specify

. . . to alert a night-driver's eyes?



Does the road ahead turn right? Turn left? Go straight?

Vital questions!—and many a night driver has missed the answer.

Witness the accident rate after sunset; less traffic, yet the majority of fatal accidents happen at night.

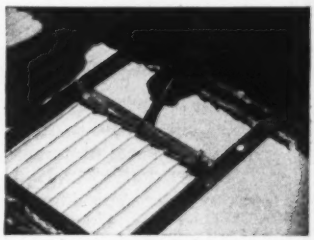
No wonder *night safety* is emphasized in our newest highways—no wonder Atlas White Reflecting Curb is part of the plans of great highways still on the drawing boards. It *alerts* a night-driver's eyes. Gives a clear, visual outline of the road ahead. The picture at the top of this page is typical of Reflecting Curb—bright, white and clear. Had it been snapped on a rainy night, the contrast would be even more distinct. Wetness makes the corrugations gleam.

The bottom picture shows you the contrast. It's ordinary grey curbing. Hard to see on a dry night, harder still in wet weather.

Reflecting Curb is a definite *safety factor* day or night—dry weather or wet. And it makes night driving pleasanter by reducing strain and fatigue.

As to placement of Reflecting Curb, it's fast and simple. One method is to pour a mortar mix made with Atlas White Duraplastic* on a grey cement base, screed to 1-inch thickness, and score with a hand tool (pictured right). Contractors prefer Duraplastic because its air-entrainment feature makes the mix more workable, more plastic; makes placement and scoring easy.

For more information write: Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.



*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

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ENGINEERING NEWS-RECORD

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Designs that save materials favored for construction

National Production Authority stresses good design practice, seeks quick adoption of further uniform standards—Industry seen ready for an outstanding conservation job

Construction applications submitted to federal claimant agencies and National Production Authority industry divisions (ENR Aug. 9, p. 23) will have a much better chance for approval if the projects are designed to use a minimum of the controlled materials—steel, copper and aluminum. Use of aluminum will be allowed only in small quantities for industrial jobs.

Engineering and architectural designers will do their clients and themselves a favor if they will apply ingenuity to designing structures that require only minor quantities of the critical metals.

• **How to gain favor**—Structural shapes and steel plate are two products that will be in acutely short supply for the next 10 to 18 months. The designer who eliminates these items—or cuts them to the bone—in his plans will be sure of more favorable consideration for his project during the shortage period. The man who insists on more prodigal use of the short materials probably will have to stand in line until the shortage ends. That might mean waiting until 1953.

Those facts stood out plainly in Washington last week. Charles E. Wilson's Office of Defense Mobilization and its programming and operating agencies—the Defense Production Administration and the National Production Authority—were unanimous in their intention to encourage construction conservation of critical materials.

The pinch of severe shortages left them no choice. Even if the government made no effort to encourage economy in the use of steel, copper and aluminum, the hard facts of the defense emergency would require postponement of all projects—except the indispensable ones—that require large amounts of the critical metals.

But this time the government agencies hope to make suggestions that will help owners and designers to get quicker approval of their projects. There will be nothing mandatory about the suggestions. You can take advantage of them if you wish—or ignore them if you want to. The latter choice may delay you several months in starting construction.

Administrator Manly Fleischmann was going to look over the first of the recommended suggestions last weekend. If he approves, NPA will soon start issuing them.

• **What to expect**—Nothing specific can be promised in advance of official action. But the general outline of what the agencies hope to do is this:

Good design practice will be the No. 1 requirement in consideration of project plans by any claimant agency. Any overages—wasteful or unnecessary use of materials—would bar approval.

NPA's steel people particularly will want to know how the steel in the structure is being used. The applicant will be wise to specify his working stresses, loads and the compelling reasons for long spans, if using them.

Construction consultants in the ODM office would like to put the responsibility for economical design where it belongs—on the designer. The idea would be to have the designer submit a letter with the CMP-4C application stating that the design is the most economical—in use of critical materials—that can be devised for a safe, durable structure. Such a letter, signed by a registered engineer or architect, would be accepted as prima facie evidence that the project meets the best conservation standards.

• **Who can help**—The designer's letter should specify that the structure is designed for its immediate purpose. If a building is intended first for commercial use at 60-lb live load, for example, the plans could not allow 150-lb loading for possible future use as a warehouse.

Signed letters from registered designers would dispense with the need for close examination of plans by NPA and the claimant agencies. In War II, WPB used to strip down designs that showed obvious overages before granting approval. Sometimes the stripping was salutary, but in a few structures it shortened the service life and increased the cost of later maintenance.

Signed statements probably will be adopted as standard procedure. Even

(*Continued on page 24*)

Reclamation plans total $275 million

Irrigation water will be brought to another 500,000 acres of land and 345,200 kw of hydroelectric power will be added to the nation's industrial might—under the Bureau of Reclamation program for fiscal 1952, outlined last week. Work projected is based upon an estimated construction expenditure of $275 million.

Reclamation Commissioner Michael W. Straus spelled out plans following the annual programming conference of the bureau's regional directors—held this year at Wenatchee, Wash. Straus explained that there may be some changes, dictated by the outcome of debate on appropriations sought in Congress. (House and Senate conferees last week had agreed on $232 million of construction funds for Reclamation in fiscal 1952.)

• **More power**—"The year's program," Commissioner Straus said, "will be notable for completing presently-planned capacity at the world's greatest hydro-electric power plant, Grand Coulee, on the Columbia River in Washington; and for the first major irrigation on the Columbia Basin project and the Colorado-Big Thompson project in Colorado."

"The last of the 18 huge 108,000-kw capacity generators to be placed in the power houses at Grand Coulee Dam will go into operation in a few months, bringing the total installed capacity of this great plant to 1,946,000 kw. Actual capacity of the generators will boost total peaking capacity of the plant to considerably more than 2,000,000 kw.

"At the Boulder Canyon plant at Hoover Dam, three additional generators with a total capacity of 220,000 kw will be placed in operation, bringing the capacity of this plant to 1,400,000 kw and the total capacity of the integrated system at the Hoover, Davis and Parker dams to 1,745,000 kw. Work also will proceed on one final additional unit at Hoover Dam which will be placed in operation next year, bringing this plant to a total

(*Continued on page 24*)

Designs to save materials urged . . .

(*Continued from page 23*)

if not required. NPA's second consideration in looking over project plans—next to good design practice—will be evidence of ingenuity in reducing consumption of critical metals. Every designer, the agency feels, is ingenious enough to devise ways of saving materials.

• **Where they save**—Structural design is not the only place where controlled materials must be saved. Copper is as tight as structural shapes or steel plate—probably tighter. Electrical and mechanical installations rate in importance equal, or superior, to structural.

Many designers are hard at work today re-examining their wiring and piping diagrams to save copper. New aluminum plants, surprisingly, are an example of this restudy. Badly needed as these plants are, their copper requirements for the fourth quarter of this year reportedly were cut 80%.

DPA's building construction subcommittee—a wing of the overall conservation group—is pushing for speedy adoption of uniform standards, both for all government-financed programs and also for suggested use by designers of private projects. It already has obtained full federal acceptance of four sets of standards: For structural steel, reinforced concrete, timber and plumbing (ENR July 26, p. 30).

The subcommittee has requested the American Standards Association to speed completion of its revised manuals for masonry, excavation and foundations, and design loads, in order that those standards also may be adopted. Likewise, it has asked the American Welding Society if added suggestions should be made, beyond the recommendations in the structural steel standards.

• **When it helps**—In the opinion of ODM people, construction this time is ready to do an outstanding conservation job. In its planning, they feel, construction is ahead of any other industry except possibly the radio and television manufacturers.

With only half of the required structural steel available for the fourth quarter—and not much more in sight for the two succeeding quarters—structural designers are hard at work on alternate designs to save all types of steel, including reinforcing bars. At the same time, they are digging up ways to cut down their copper requirements and to dispense with aluminum altogether, wherever possible.

Seek $21.8 million for flood area work

Here's how the Corps of Engineers plans to spend the $21,800,000 that President Truman has asked Congress to appropriate for flood control and rivers and harbors work in the Midwest—scene of recent disastrous floods:

• **Flood control**—Tuttle Creek bank protection on the Arkansas River, $5,000,000; Toronto Reservoir, Kansas, $3,000,000; Oolagah Reservoir, Oklahoma, $1,500,000; Mississippi River levee work (between Wood River, Ill. and East Cape Girardeau, Ill., $1,500,000; Wichita and Valley Center, Kansas, $500,000; Hutchinson, Kansas, $1,900,000.

• **Flood control planning**—Topeka, Kansas, Strawn, Kansas, Pomme de Terre Reservoir, Mo., and Cape Girardeau, $700,000 (total).

• **Rivers and harbors**—Bank protection work on the Arkansas River in Arkansas and Oklahoma, $4,100,000.

Reclamation . . .

(*Continued from page 23*)

capacity of 1,482,500 kw."

• **Water and power**—On the Colorado-Big Thompson project in northeastern Colorado, approximately 206,000 acres will receive a supplemental irrigation supply from water diverted from the Colorado River through the Continental Divide via the Alva B. Adams Tunnel and stored in the Horsetooth Reservoir (ENR Aug. 2, p. 27).

The first irrigation on the million-acre Columbia Basin reclamation project in Washington State by gravity flow from the Grand Coulee equalizing reservoir will occur next spring. The reservoir is now filling with water from the Grand Coulee pumps which went into operation this summer (ENR June 28, p. 27). More than 65,000 acres will be under irrigation next spring. A small area is already being supplied by pumping directly from the Columbia River.

• **Wide areas to benefit**—In the Southwest, about 73,900 acres of irrigated land are to receive a supplemental supply during the year. The upper Missouri River Basin area of Wyoming, Montana and the Dakotas will see 10,800 acres of new land brought under irrigation and a supplemental supply furnished to 55,700 acres. About 12,500 acres of land along the Republican River in southern Nebraska are also scheduled to receive water for the first time, as a part of the Missouri River Basin project.

Specific details of the program await passage by Congress of the 1952 appropriation bill. Only then can construction funds be allocated to each project.

Prefabs part of Indiana public housing development

Gunnison Homes, Inc., a prefabricated housing subsidiary of U. S. Steel Corp., takes the distinction of being the first in its industry to enter the field of public housing.

William E. Bergeron, director of the Chicago office of the Public Housing Administration, has revealed that 91 Gunnison prefabricated buildings will be erected in a public housing project in New Albany, Ind.—which, incidentally, also is the home town of the Gunnison factory.

Bergeron states that the average room cost, including ranges and refrigerators, is $1,654. Average total development cost per dwelling unit, including land, site improvements, equipment and engineering and administration fees is $10,710.

The New Albany project will include 128 buildings. The 91 prefabricated units will house 204 families in 81 one-story duplexes and 10 one-story, four-family row houses. The other 37 buildings will be row houses of frame construction. The Gunnison dwellings will incorporate standard materials as they come off their assembly lines. Exteriors will be covered with asbestos siding to meet current FHA requirements.

TOPPING OUT SALUTE—American Bridge Co. steel workers raise Old Glory atop the third structure in Equitable Life Assurance Society's Gateway Center on Pittsburgh's Golden Triangle (ENR Oct. 5, 1950 p. 29). Eight buildings are planned for the center. General contractor is Starrett Brothers and Eken, Inc., New York; American Bridge is supplying and erecting the steel. The tall building in the background is the new Mellon building and left of the flag, is the structural framework for the Alcoa building. (Photo courtesy Mine Safety Appliances Co.)

Congress debates military, civil construction bills

Two major bills affecting the construction industry are before Congress this week for debate: The $5.7-billion military construction program; and the $600-million civil functions appropriation.

The military construction program is before the House. This is a bill that will authorize, not finance, the construction of military bases.

Some construction can begin shortly after the House passes this authorization bill. That does not mean the whole program will be put into effect immediately. But the Armed Services can divert some funds from 1952 regular appropriations.

The military Appropriations Bill (H. R. 5054) was passed by the House Aug. 9 and it is now before the Senate Appropriations Committee. Hearings on the bill may last from one to three weeks, maybe longer.

In passing this bill, the House did not change the amounts requested in the original bill for the Corps of Engineers military construction, $48,363,700; for Navy public works construction, $50,414,000; or the Air Force's item for acquisition and construction of real property, $85,000,000.

The majority of these funds is to settle for previous contracts and very little new work will be started with these amounts. They will serve, however, to help get the new military construction program underway.

• **Civil functions**—At the same time, the Senate was considering the civil functions appropriations measure (H. R. 4386), reported out by the Senate Appropriations Committee a week ago.

As passed by the House, the measure carried $515.4 million for river and harbor and flood control work. The Senate committee jumped this amount to $637.3 million. For rivers and harbors alone, the Senate version provides $213.9 million, for flood control $329.9 million. Other amounts are also included for the Panama Canal and additional uses.

Overhead rapid transit proposed for Los Angeles

A proposal to create a suspended, overhead transportation system in Los Angeles County, Calif., gained support recently when Gov. Earl Warren signed a bill establishing a Los Angeles Metropolitan Transit Authority.

The legislation empowers the authority to construct, maintain and operate a mono- or dual-rail system stretching 41 miles from Van Nuys to Long Beach, through Los Angeles.

SIDEWALK OF KANSAS CITY—O. F. Turner of Atchison, Kans., who does custom bulldozing, came to the stricken twin Kansas Citys with his equipment and assisted in "operation cleanup." Contractors came from miles around to help and machinery manufacturers and suppliers made available essential new equipment to remove debris and a 10-in. layer of mud left behind by the flood. Weeds caught on sign above tractor were deposited there by high water. (Photo, courtesy Allis-Chalmers)

Stored water to make power for Maine paper company

The Great Northern Paper Co. plans to put to additional work the 690,000 acre-ft of water that is stored annually behind its Ripogenus Dam at its plants in Millinocket, Me. To put this resource to greater tasks, the company's engineers plan to take water from above the dam and lead it by means of a tunnel to a power site in the gorge below the dam, known as Little Heater Island.

This tunnel, about 4,000 ft long, and to be lined with concrete to give a finished inside diameter of 16 ft, will be bored through solid diabase and granitic rock and at places will be as much as 250 ft below the surface of the ground. The power site will take advantage of a gross head of about 184 ft.

To bring this power to its mills, the company plans to build a 110,000-volt transmission line about 30 miles in length. To conserve on critical marials, this line will be carried prinarily on creosoted southern pine.

Company engineers also plan construction of a new road and a truss bridge to cross the West Branch of the Penobscot River, as the old road cannot be kept open in the winter. The bridge will consist of two 150-foot spans and concrete abutments and piers. Stone & Webster Corp. of Boston is aiding in the project. Contract for the tunnel work has been awarded to the Savin Construction Co., East Hartford, Conn.

Harlan County Dam closed; to be completed next year

Closure of a 40-ft notch recently marked the beginning of water storage behind Harlan County Dam, a $49-million Corps of Engineers project and one of the key installations in the Missouri Basin flood-control plan (ENR Apr. 5, p. 29).

Located on the Republican River in southern Nebraska, the 11,828-ft dam is expected to control flash floods on this Kansas River tributary by providing storage capacity for 850,000 acre-ft of water in a reservoir 15 miles long. In addition, the normal storage pool of 350,000 acre ft will furnish irrigation for a 90,000-acre Republican area.

Constructed primarily for flood control and irrigation, the dam also incorporates concrete sections flanking the central, 856-ft spillway to make future installation of hydroelectric units possible. Its importance to the Kansas River Valley area is explained by Pick-Sloan Plan sponsors who claim it could have contained the entire flow of the Republican during the recent disaster.

Principal contractors are Marc Walker and Son and the Harlan Construction Co.—which includes Guy F. Atkinson Co., Bressi and Brevanda Construction Co., Charles L. Harvey, Inc., W. E. Teichert and Son, Inc., David C. Gordon and the Trepte Construction Co.

Rail relocation was handled by Missouri Valley Construction Co. and Morrison-Knudsen Co.

Missouri Basin pollution report now available

Another of the cooperative State-Federal reports on water pollution in major river basins is out. This time it involves recommendations for expenditures of $149 million at 677 municipal and industrial locations in the Missouri River Drainage Basin. Ten states helped draw up the study, the second of 15. (First of the series was the Tennessee Basin Report commented on in ENR Apr. 19, p. 31.)

The report describes water pollution conditions in the 521,000 sq mi of the Missouri River Basin with its population of 8,200,000. This area's streams receive domestic wastes (including some industrial wastes handled in municipal systems) of 4,855,600 persons. Industrial wastes of 8,486,500 population equivalents constitutes one of the basic discharge problems.

To meet this, there are some 677 waste treatment projects reported under way or contemplated there to serve the needs of some 593 municipalities and 84 industries. The cost to municipalities is put at $115 million, the cost to industry at $34 million.

The report found that no projects are needed at 338 municipal and 19 industrial locations, and that projects needed have not yet been determined in 81 municipalities and at 85 industrial locations where engineering studies are under way or may be needed.

Progress in the basin in the fight against pollution was indicated by the construction of 59 municipal sewage treatment plants and 11 industrial waste treatment works in the basin during the three years 1946 to 1949.

San Diego area studies waste disposal

The San Diego County (Calif.) Board of Supervisors has ordered a comprehensive investigation of the sewage and industrial waste collection and disposal problem in the county and has appropriated $60,000 to finance the study.

The action came on recommendation of the Metropolitan Sewage Planning Committee of San Diego County. Three engineers, familiar with metropolitan-type sewage problems, will be retained to conduct the survey.

Jean L. Vincenz, county public works director and chairman of the committee, and Harold E. Miller, executive officer of the Regional Water Pollution Control Board and secretary of the committee, estimate that agencies in the county will spend $20,000,000 in sewage disposal works during the next 10 years A progress report by the committee noted:

"If the present piecemeal type of development is permitted to continue, it must be anticipated that one-half again that amount will be spent in the years immediately following to correct the situation which is bound to develop."

The preliminary survey found that present individual plans of cities and other agencies in sewage treatment works and appurtenances call for immediate expenditures of nearly $2,000,000. It added that another $1,500,000 will be spent almost immediately on plants or private disposal systems.

• **Waste to the bay**—A sanitary survey of San Diego Bay just completed indicates that certain areas of the bay have about reached capacities for receiving wastes if nuisances and adverse economic effects are to be avoided.

It was pointed out that while each of the cities has in the past retained as many as three independent engineering firms, no two recommendations have been in accord, nor have any taken proper cognizance of adjacent and related problems.

No real consideration is being given now to the relationship between sewage disposal and water development and distribution. There has been no consideration of the possible need for reclamation of water from sewage and industrial wastes.

The present individual approach works an inequity on cities which have financed sewage disposal systems, and are being prodded constantly to make their limited capacities available to adjacent areas.

FOR AIR DEVELOPMENT CENTER—Elk River Dam, near Tullahoma, Tenn., will impound water to supply cooling and domestic needs of the U. S. Air Force Arnold Engineering Development Center, about five miles northeast of the site. Named after the late Gen. H. H. (Hap) Arnold, the center will contain facilities for testing guided missiles, supersonic aircraft and aircraft powerplants. This is the spillway site. Dam height will be 90 ft; overall length, including earth section, will be 2,943 ft. Contractors are the Arundel Co., Baltimore ,and L. E. Dixon, San Gabriel, Calif. Lt. Col. Hugh M. Arnold is Tullahoma District engineer for the Corps of Engineers, builders of the project.

N. C. starts action on polluted streams in state

Governor Kerr Scott of North Carolina has appointed six members to a state stream sanitation committee, created by the 1951 session of the state legislature and empowered to curb stream pollution in the state.

In creating the new committee, the legislature defined the rules and powers under which it will operate and stipulated that five of the six members to be appointed by the governor to the initial board would be from the membership of the existing State Stream Sanitation and Conservation Committee which was created by the 1945 legislature, with the exception of one member experienced with wildlife activities.

Those named by the governor include: Mayor Scott B. Berkeley of Goldsboro; State Rep. J. Vivian Whitfield, Burgaw, sponsor of the 1951 stream sanitation bill; Mrs. G. W. Cover, Andrews; W. P. Saunders, Robbins; and Carroll Rogers, Tryon, all members of the old body.

Also named is H. Grady Farthing of Boone, farmer, former state senator and former district game supervisor for the State Department of Conservation and Development, who is representing wildlife interests.

Ex officio members of the committee, which is set up under the State Board of Health, are J. M. Janett, chief sanitation engineer of the health board, and W. H. Riley, chief engineer of the Water Resources and Engineering Division of the Department of Conservation and Development.

Commission to report on Three Rivers bridge

A commission to report on the cause of failure of the highway bridge at Three Rivers, Quebec, has been named by Premier Duplessis. It consists of Rene Lippe, a lawyer, and J. Lucien Dansereau, a civil engineer, both of Montreal.

Four spans of the eight-span, continuous, welded bridge over the St. Maurice River at Three Rivers collapsed during the night of Jan. 30-31 (ENR Feb. 8, p. 23). As all four spans sank below the ice, salvage work was long delayed, first due to winter conditions and then by spring floods, but the spans now have been cut free from their heavy concrete deck and soon will be available for study. Salvage work is being done by the Foundation Company of Canada.

Premier Duplessis has asked the commissioners to establish:

(1) Whether the bridge collapse was due to the fault or negligence of the Quebec government or of any of its departments, employees or officials; (2) what parts of the bridge were defective, whether its "pilings" or superstructure; (3) whether the bridge collapse was due to the fault or negligence of the builders of the bridge or their construction-work employees; and (4) if the Bailey bridges now built across the St. Maurice River as a temporary crossing were properly and diligently erected.

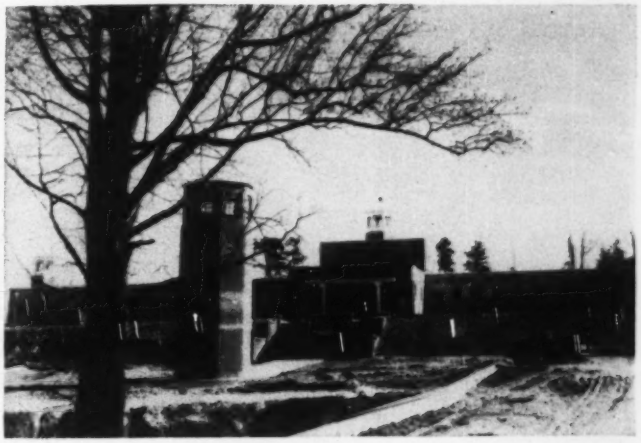
The commissioners have been requested to complete their study within two months, if possible.

Meanwhile, the Dominion Bridge Company, which built the bridge, has retained C. R. Young of Toronto, J. A. Lalonde of Montreal and Ernest E. Howard of Kansas City to act as its consultants.

Rail yard to be eliminated from downtown Nashville

Directors of the Nashville, Chattanooga and St. Louis Railway have approved a plan to eliminate the road's Kayne Avenue yards in the downtown business district of Nashville, Tenn. (ENR July 5, p. 53). New yards will be built in the Woodbine area, southeast of the city, at a cost approximating $100 million. The plan had been agreed to previously by the Louisville and Nashville Railroad, which also uses the yards.

Present plans for development of the relinquished Kayne Avenue property include the building of warehouses at ground level and retail stores fronting on viaducts. Rail tracks to be retained will be underneath and would no longer divide the city.



BIG ONE OUT OF LITTLE ONES—Newly-finished Rock Quarry Prison near Buford, Ga., was designed by a prisoner-architect and built by skilled prisoner-workmen. Was constructed to house 325 hardened and incorrigible inmates. The new penitentiary is valued at $1 million, was built in nine months. (Wide World photo)

Fatalities on Engineers' jobs total 61 in 1950

During 1950, 61 civilian employees lost their lives on work being directed by the Corps of Engineers. Nine were government employees; the rest were employed by contractors. The information recently was made public and the construction section of the National Safety Council has made a study of all the fatal accidents involved and classified them into five major causes.

In 28 cases (46%) mechanical equipment was involved (exclusive of motor vehicles). In nine cases (15%) working surfaces were involved. Eight cases (13%) involved motor vehicles.

Floating plant accidents totaled five cases (10%); and trouble in excavations involved five men (8%). Of the five remaining, one each is attributed to occupational disease (silicosis), firearms, poison, blasting and fire.

Farm loss of $76 million estimated for Kansas

According to Emmett Wormer, chairman, the Kansas Agricultural Mobilization Committee sets losses from the July floods at $76,338,000.

More than 20,000 of the state's 137,000 farms suffered damage. Farm dwellings completely destroyed totaled 244 and 3,724 others were damaged badly. Some 455 barns were lost and 3,564 received heavy damage. In addition, almost 13,000 other farm buildings were destroyed or require major repairs as a result of the rampaging waters.

Richard Sutton Buck, bridge designer, dies

Richard S. Buck, last of a distinguished group of engineers who were active in the great bridge-building era that began about 1890, died in Washington, Aug. 1, aged 86.

A graduate of Rensselaer Polytechnic Institute in 1887, Mr. Buck participated in the design on construction of the two arch bridges below Niagara Falls and the suspension bridge over the gorge at Queenston; also in the design and construction of both the Manhattan and Queensboro bridges over the East River at New York. Twice during his active career he served as chief engineer of the Dominion Bridge Co. in Canada.

At the outbreak of World War I, Major Buck was assigned to the Eleventh Engineers, and while serving with that regiment in France participated in two unusual assignments.

One was a very secret study of the possibilities of mounting field artillery pieces on car bodies that could run on the narrow gage (30 cm.) railways that were being used so extensively behind the British lines. This work won for Major Buck the D.S.O.

Buck's second special assignment was made as a preliminary to the St. Mihiel offensive of the U. S. Army. It was the design of reinforcement that could be quickly applied to the bridges of a metre-gage railway that was to be widened to standard gage by the Eleventh Engineers as the Germans were pushed back, thus permitting heavy American equipment to use the light bridges.

HUNTS POINT on the Bronx side of New York's East River didn't always look like this. Before present sewage works construction began, the dotted line was the shore line. (N. Y. C. Police Dept. Photo)

Sewage works, power plant, factory or mill—

First, you need a construction site

How to make a construction site out of a lagoon was the first and toughest problem met and solved by constructors of Hunts Point sewage treatment works on the Bronx side of New York City's East River.

This $23,000,000 step-aeration sewage works had been designed for the City Department of Public Works during World War II by Greeley & Hansen, Chicago. Now more than half finished, the 120-mgd plant covers an area of 26 acres, roughly two-thirds of which was formerly under water. Rock depth varies from 55 ft to outcroppings.

Designers proposed that a willow mat (common on Mississippi River bank revetment work, but relatively unfamiliar on the East Coast) be sunk in the shallow lagoon—and topped with a 3-ft depth of earth fill—a work mat through which piles could be driven to support plant structures.

• Contractor's alternate accepted— But a waterfront specialist got the job's prime contract, proposed an alternate site preparation method, and probably has given the city a better finished site than originally specified. The plant is on solid fill behind a riprapped earth dike. J. Rich Steers, Inc., bid low on the work, got approval of his method, and began in late 1949 to make land out of water.

Fastest and cheapest way to fill the lagoon was by delivering sand on deck scows to be unloaded by floating derricks. But in order to float sand in, some of the soft mud had to be removed, and the lagoon had to be deepened.

Great Lakes Dredge and Dock Co. subcontracted to prepare the way for the filling operation by removing some 234,000 cu yd of mud from the shallow bottom with a floating bucket dredge. Water over the area to be filled was deepened to El.-17.0 to accommodate scows with 12-ft draft carrying 850-cu yd loads of fill. By planning to bring fill in at high tide, the contractor kept dredging to a minimum. (Tide range is about 5½ ft. Datum used was 2.608 ft above msl at Sandy Hook.)

Sand for fill was brought from Northport, Long Island, where it had been loaded into the barges at the contractor's own sand and gravel plant.

Once inside the lagoon the scows were unloaded so as to deposit a 4-ft blanket over the whole area—this special care being taken to avoid forming a mud wave on the lagoon bottom during the fill operation. After the initial blanket was in place the fill proceeded up to grade.

It was a nip-and-tuck operation—the scows being shoved in on the high tide, unloaded, and pulled out

empty on the ebb tide. The contractor would bring in a scow, empty half its load, remove it to make room for another full load, then bring it back in to empty the other half when the tide had receded.

• **Dike construction**—Even as the lagoon was being filled, the contractor proceeded to close its mouth with a sand retaining dike that rises 5 ft above mhw and extends nearly 1,000 ft in length.

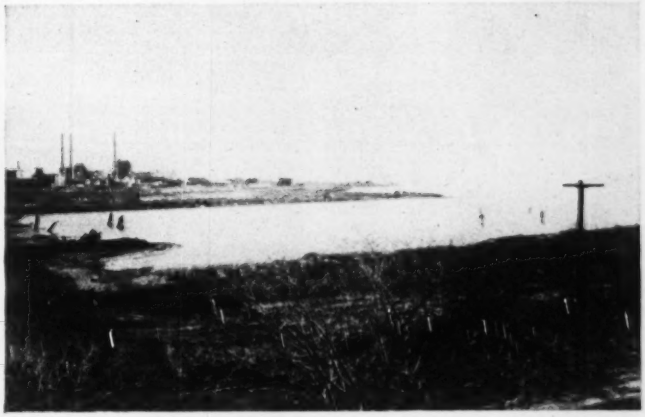
Extensive dredging was done before placement of dike material. Throughout most of the length, enough mud was excavated to give a minimum 30-ft bearing width some 27 ft (average) below original river bottom. The resulting trench into which dike material went was a trapezoidal cut with sides sloping about 1 on 3.

The dike itself has a minimum 20-ft top width, a landward slope of 1 on 2, and a riverward slope 1 on 1½. The river slope is protected by a minimum 5-ft cover of traprock riprap. Riprap was placed right along with dike material (sand, containing less than 5% clay) as indicated in the accompanying drawing. Generally, the procedure was to place a 10-ft high windrow of riprap on the outer slope of the dike, fill behind it to the level of its top, then place other barriers, each 5 ft high, farther up the slope to retain the succeeding layers of sand as they were placed. Soft dike material was placed with a clamshell on a floating derrick; an orange-peel bucket handled riprap.

• **Big bulb anchors dike end**—At its upstream (east) end the new dike abuts an existing bulkhead—a concrete capwall on timber piles, which had to be broken in the course of the work but will be restored. In this area, excavation was taken down to El.-55.0 to sound material, making a great gaping hole nearly 400 ft long x 300 ft across into which went the bulbshaped end of the dike.

When the scows shipping fill into the lagoon finished their work, the dike was closed—some 200 ft from its east end. All excavation outside the dike was backfilled to about El. −6.0 and immediately within the dike the construction site was leveled off at El. −7, wellpoints cutting off seepage to keep the site dry during all stages of the work.

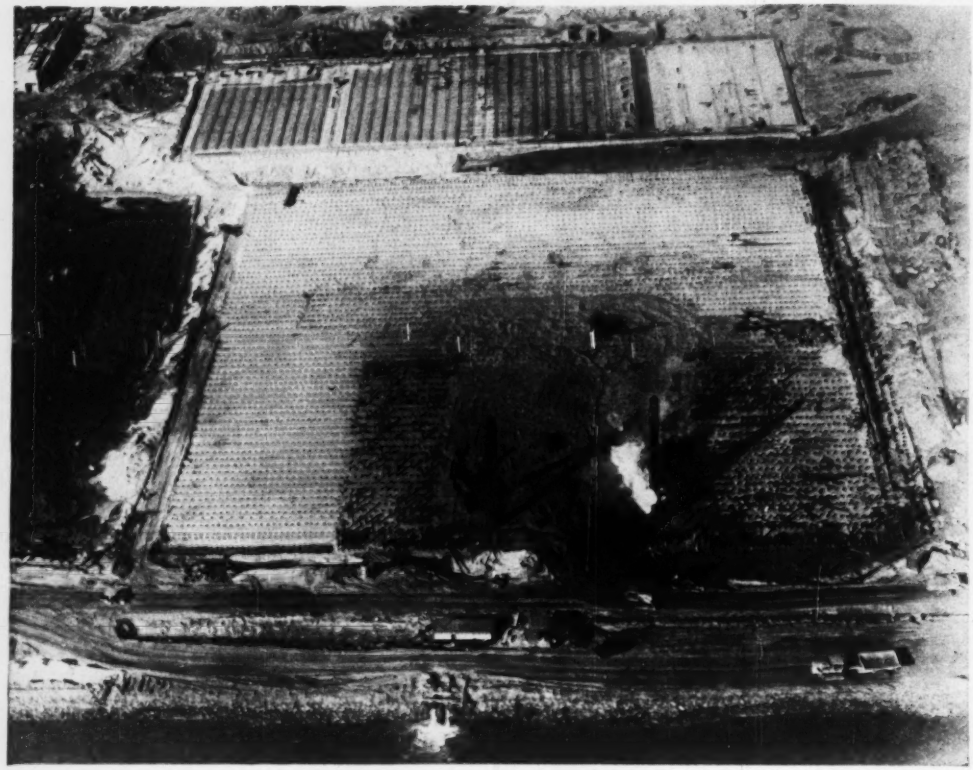
(Hunts Point took a beating in the Nov. 25, 1950, storm that hit New York City with 75-mph winds, causing record high tides. The dike was overtopped with considerable, but reparable, damage. Foundations for aeration tanks and much of the equipment at work on them were swamped. But except for that extreme occur-



BEFORE CONSTRUCTION STARTED some two-thirds of the site was under water of a shallow lagoon.

DIGGING IT OUT—A floating dredge had to dig out soft mud and deepen the inlet so fill could be floated in.

FILLING IT IN—Scows carrying sand were shoved in on the tide, unloaded with care so as to prevent mud wave.



PILE PATTERN in aeration tank area is exceptionally uniform. Nearly all of the job's more than 30,000 piles are in the made-land in this picture. Driving was easy through the sand fill. Note wellpoint discharge through finished dike in center foreground.

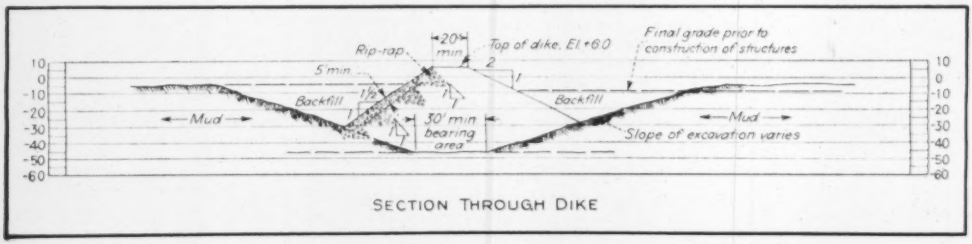
rence which dealt the whole Northeast Coast a severe blow, there has been no water trouble on the construction site since the dike was finished. Two to three thousand gpm has been the maximum pumpage by two 8-in. pumps of the wellpoint system).

• **Wharf construction**—Digested sludge from Hunts Point (as from all other New York City sewage works) must be pumped aboard 1,500-ton capacity ocean-going tankers of the city's three-ship sludge fleet, for disposal at sea. So a wharf had to be built near the digesters, at the extreme downstream (west) end of the plant.

Here again original design called for one construction, the contractor proposed and built another.

Foundations for the 520-ft long concrete wharf, where 260-ft sludge tankers will tie up to be loaded, were first to have been rock-filled timber cribs. But again, the contractor weighed the method against the men, materials and equipment available to him—and got the green light on placing a tremie concrete base for the wharf. And again, the city got a very satisfactory job.

A drill-boat of The Arundel Corp. was subcontracted to do the rock excavation needed to found the wharf. Rock removed totaled 17,600 cu yd and was cut to El. −23. A clay blanket was placed on the rock; a steel sheetpiling enclosure 21 ft wide



DIKE SECTION VARIES, but this is fairly typical for portions that required dredging of a trench before dike placement.

was driven to rock, then cleaned out to rock. This was filled with tremie concrete to 4 ft 10 in. below mhw. Then forms were built and a concrete cap wall 10 ft high was poured—its top 5.17 ft above mhw. This wall is 9 ft 6 in. thick at its bottom, 4 ft 6 in. at the top.

• **Subaqueous outfall**—The final element of waterfront construction—now partially completed—is a rectangular reinforced concrete outfall that will discharge the plant's effluent (90% suspended solids removed) into the East River.

This structure was built on rock—soft, seamy schist—inside a sheetpile cofferdam. Walls are 24 in. thick at the outfall end, 12 in. thick in near shore; inside dimensions of the outfall section are 9 ft 9 in. x 9 ft. Provision is made for a temporary bulkhead in the outfall at shore line; placement of this gate will allow flooding of the 166-ft offshore length of outfall once it is completed and it will thus permit early removal of the cofferdam.

• **Behind this protection**—Meanwhile, inshore, construction follows the currently conventional design for New York treatment works. The pump and blower building is a steel frame structure faced with brick and founded mostly on steel pipe piles driven 10 to 40 ft to rock and filled with concrete; partially on rock-based piers.

All structures on the made-land portion of the site are on timber piles driven to sand or rock resistance and averaging near 40 ft in length. Among these are the primary settling basins, the aeration tanks, and portions of the final settling tanks. Where final sedimentation structures rest partly on rock foundation and partly on virgin earth material, the contractor was required to excavate the rock and place a 1-ft layer of sand for both drainage and for structural reasons.

Walls of digester tanks are carried by reinforced concrete spread footings on rock or earth. Their bottoms—six of the hopper type and two only slightly dished—rest on compacted fill or undisturbed soil. Tank diameters vary (118-ft 2 in., 118 ft, 1 in. and 116 ft, 7 in.). Their 12½ in. and 10 in. thick walls are being prestressed. Gas holders will be mounted on the two shoreward (secondary) digesters, and the methane gas produced will be burned in the plant's four gas engines located in the pump and blower building. An 81-ft dia storage tank will hold sludge for loading aboard ship.

• **In residence**—H. G. Vermont is resident engineer for the city's Department of Public Works, assisted by Pete Geis; Alfred R. Glock is chief, bureau of construction. Clayton O'Connell is job superintendent and Jack Malcolm, general superintendent, for J. Rich Steers, Inc.

Design and construction of the plant is under Richard H. Gould, director of the department's division of sewage disposal. W. A. O'Leary is chief, bureau of design, and Joseph Cunetta is project engineer for the department.

For the general contractor, J. Rich Steers, Inc., Gene Rau is chief engineer. Frederick H. Zurmuhlen is commissioner of the Department of Public Works for New York City.

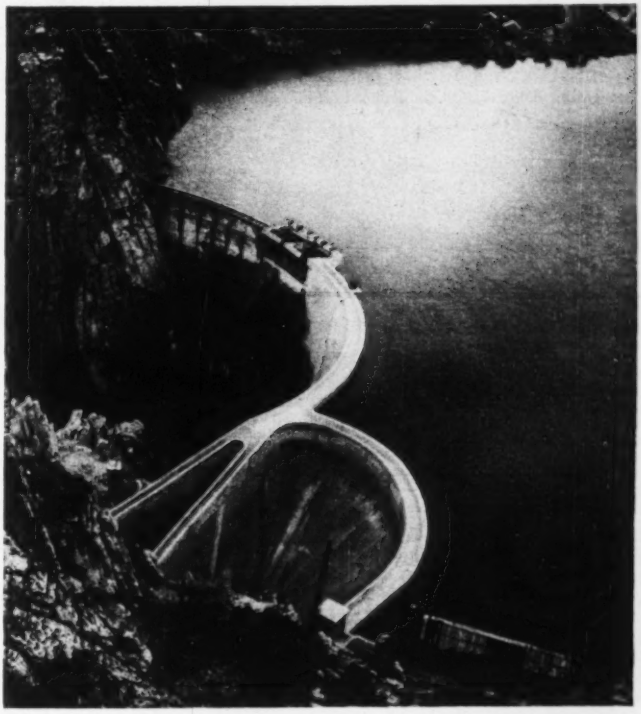
Unusual abutment required for arch dam in Portugal

Discovery of poor rock in the left abutment of the Santa Luzia Dam in Portugal resulted in a redesign involving adoption of the unusual abutment construction shown in the accompanying photograph.

Construction of this dam by the Compania Hidroelectrica das Beiras was begun just before World War II. As work progressed upward, it was found that rock on which the left abutment was to rest for the upper third of its height was not as sound as preliminary investigations had indicated, due to a fault.

Upon the recommendation of A. Coyne, consulting engineer on the project, the intermediary gravity abutment was built to distribute the thrust and the auxiliary arch was added.

The dam is 65 meters high. Work was started in 1939 and completed in 1945, under the direction of Joseph Felipe Rebelo Pinto, now engineer in chief of the state services of hydroelectricity for Portugal.



SANTA LUZIA DAM in Portugal at which the left abutment had to be redesigned due to discovery of a fault zone. Abutment was reinforced; arch was added.

B&O ore pier

When the Baltimore & Ohio Railroad put its import ore pier in operation recently (ENR May 24, p. 17), most visitors to the gala event looked with awe at the two unloading machines towering above them.

A few civil engineers noted the gantries' efficient structural layout, reckoned its wheel loading, and stirred their curiosity about the type of substructure that was carrying this load so close to the pier's deep-water bulkhead.

Alongside the bulkhead, docking space was 39 ft deep. It was dredged from the shallow shore of Curtis Bay, 5 miles southeast of the heart of Baltimore. Site earth conditions consisted of soft silt 22 ft deep, overlying sand and sand-gravel strata. Including the approach channel and the 600 ft x 150-ft ship berth, dredging quantities totalled 600,000 cu yd.

The 650 x 81-ft pier job also included dredging of soft material down to El. +1. This was replaced by sand, topped with slag.

Designed to carry two 685-ton unloaders, the pier's principal structural members are pile-supported longitudinal concrete walls 498 ft long under the crane rails (see drawing for details). Each unloader corner post transfers its share of the load (variable depending on position of ore bucket) through eight wheels to two 171-lb rails.

The bulkhead consists of interlocked Z-piles with a channel cap and a twin-channel wale inside at 2½ ft above low water.

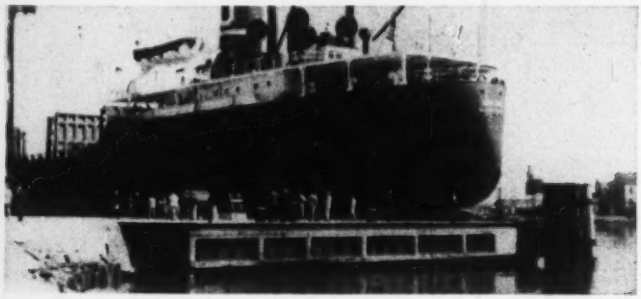
Lateral pressures on walls and bulkhead are taken by a row of batter piles under the shore wall. Tie rods from bulkhead wale to inner wall carry bulkhead and wall lateral stresses to the batter piles.

Pier areas outside the crane rail zone also are tied, mostly through unsupported deadman walls.

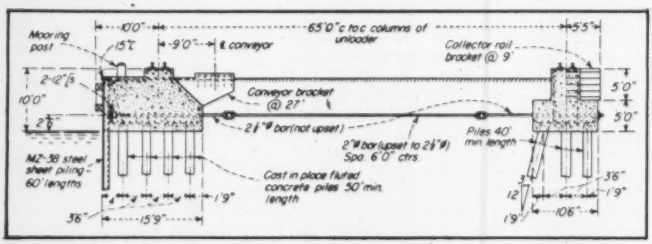
Engineering information was supplied by K. J. Wagoner, assistant chief engineer, and G. H. Dayett, assistant engineer of bridges, Baltimore & Ohio Railroad, Baltimore. Contractor on the work was Empire Construction Co., Baltimore. Empire's superintendent was Richard Miller.

This is the third of a series of articles about construction problems incidental to America's current expansion of steel making capacity.—Editor

IMPORT ORE PIER—Ore from the world's ports now comes to the United States through this Baltimore & Ohio Railroad facility, near Baltimore, Md.



SHEETPILE BULKHEAD retains pier's earth fill. Dock space was dredged in shallow mud of Curtis Bay. (ENR photo)



PIER SUBSTRUCTURE—Cross-section shows how piles, beams, tie rods, and bulkhead handle earth and unloader stresses. Longitudinal pile spacing is 5 ft.

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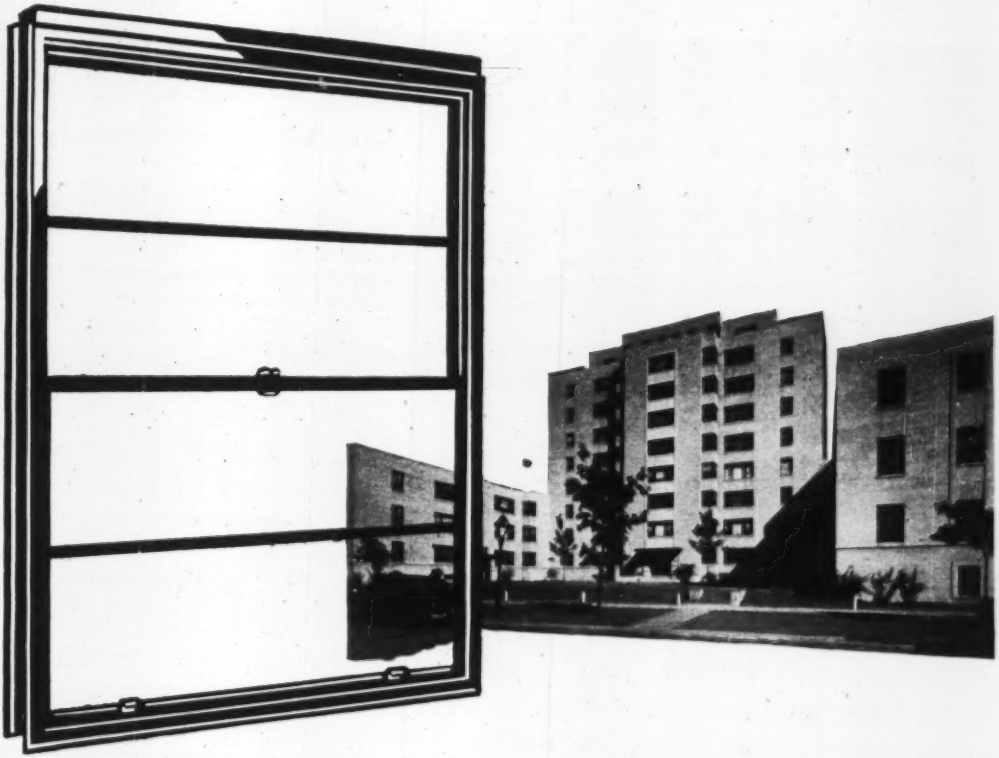

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Philip B. Maher, Architect • *W. J. Lynch Company, Contractor*

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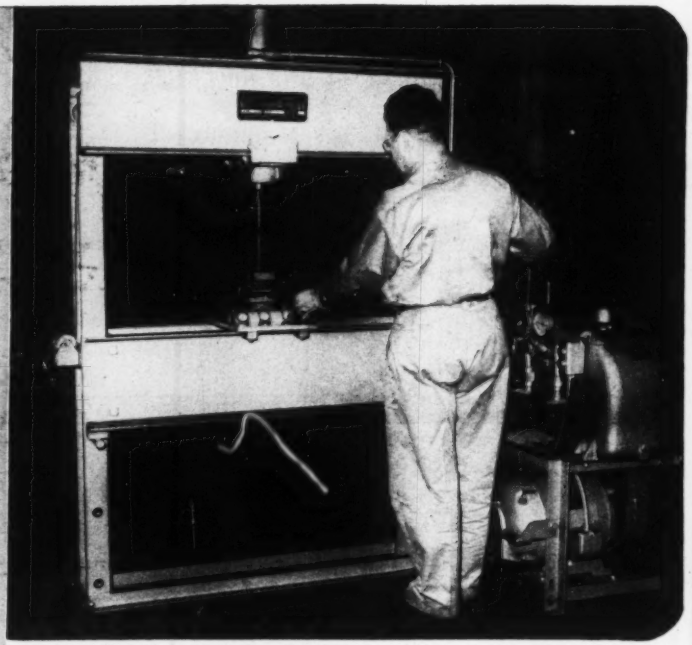

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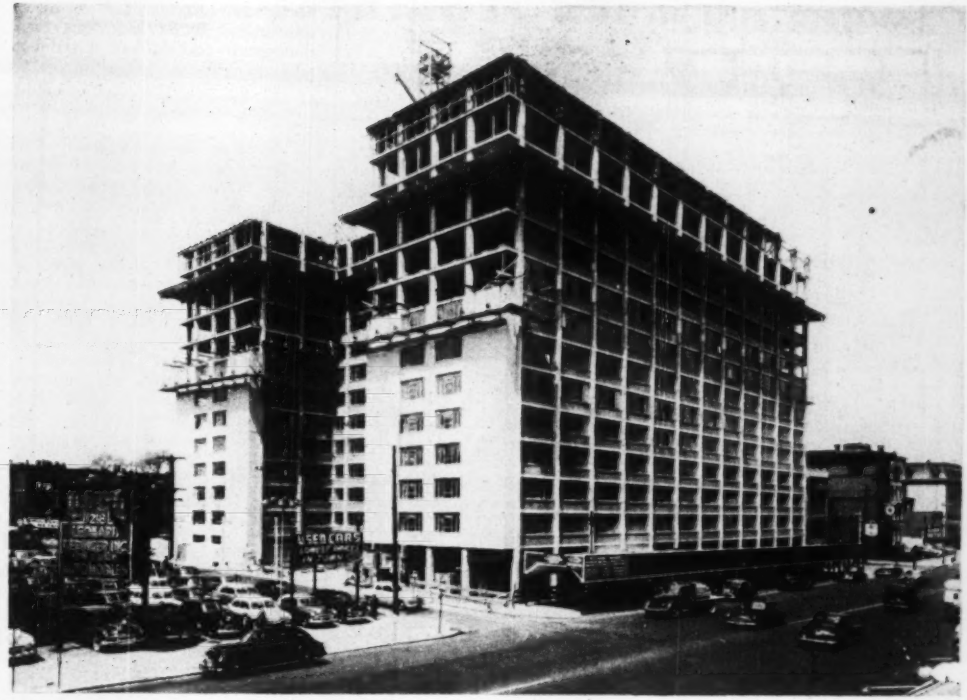


CONCRETE COLUMNS and spandrels are exposed on the exterior of the Flamingo Apartments in Philadelphia, Pa.

Formwork simplified for apartment house

Flat-slab construction cut formwork costs to begin with, but the designers and contractor had other ideas for saving time, labor and materials

EFFORTS made to save on formwork costs for the concrete frame of the Flamingo Apartments in Philadelphia, Pa., apparently paid off. Average bid price for concrete—complete with reinforcing and ceiling finish—was only $62 per cu yd.

Outstanding techniques employed include:

1. Designing the floor as a flat slab without drop panels or column capitals (similar to Quebec Houses, Washington, D. C., described in ENR May 4, 1950, p. 34).

2. Holding story heights constant.

3. Making exterior columns all the same size, with constant dimensions for their full height.

4. Fixing one dimension of interior columns for their full height and limiting changes in the second dimension to only three.

5. Minimizing cutting and fitting by dimensioning concrete members so that standard-size lumber can be used for forms.

6. Making floor-slab forms capable of being moved as a unit from floor to floor.

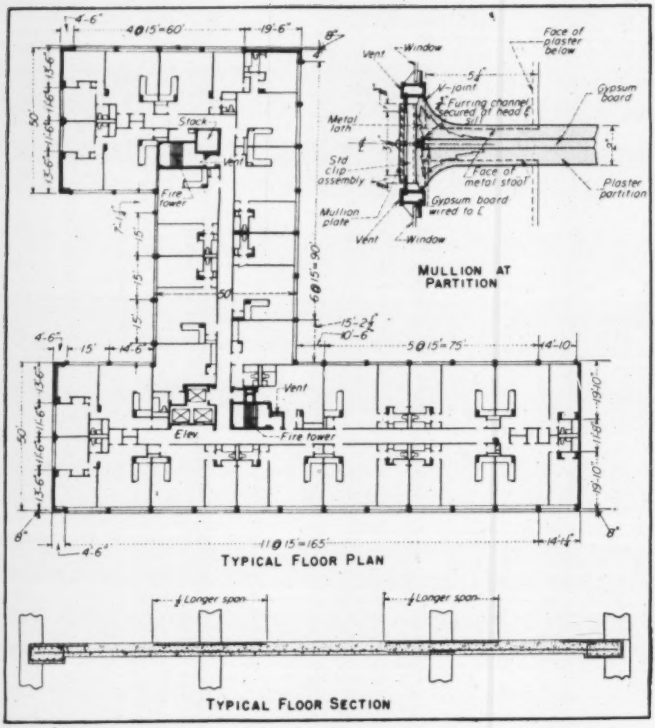
• **Column-form savings**—Built at a cost of about $3,000,000, the Flamingo Apartments is a 15-story building, L-shape in plan. The two wings of the L are 160 and 184 ft long, respectively, and 50 ft wide. Floor to floor height is 8 ft 7 in., providing a clear ceiling height of more than 8 ft.

On most of the exterior, concrete columns and spandrel beams are exposed, their white color contrasting sharply with red-brick apron walls. The exterior columns project 8 in. beyond the spandrel beams and apron walls and are 15x20 in. in section for their full height. Decided upon for architectural purposes, the fixed column size as well as the constant story height enabled column forms to be reused many times, thus producing a saving in formwork.

At each of the outer columns, the brick apron wall terminates in a vertical $\frac{5}{8}$ x 8-in. recess. Above this is a standard steel-sash recess.

Windows, continuous between columns, are framed between the bottom of the spandrel beams and brick sills atop the apron walls. Nearly all window openings are the same size, because the columns have a constant section and almost all are spaced the same distance apart—15 ft. The windows contain some fixed sash and some casements. The fixed glass is divided by a horizontal muntin so that a section of glass may be removed for installation of a window-type air conditioner (usually not an easy job with casements).

Apartment dividing walls frame into the exterior columns; but the 2-in.



FLAT-SLAB DESIGN—with no hung ceilings, no drop panels and no column capitals—simplified layout problems. Partitions frame into mullions at windows.

solid plaster partititions between rooms frame into window mullions designed to receive them. This gives the architect greater freedom in planning the layout.

In the interior of each wing, there are two longitudinal rows of columns. The columns are spaced about 17 ft apart transversely and 15 ft longitudinally, staggered about midway between the exposed exterior columns.

Design of the interior columns permitted forms to be re-used repeatedly. Columns are simple rectangles, without capitals. One dimension is constant for the full height, while but three changes occur in the other dimension, the changes being made at only three different levels.

Each set of column forms consisted of four braced plywood panels held together by metal clamps. Thus, one pair of panels was used unchanged as the building went up, while the other pair was merely pulled closer together when section changes occurred.

• Slab-form economies—Floors were designed for a live load of 40 psf, plus 20 psf for partitions, and a total load of 132 psf. They are 6-in. thick flat slabs, without drop panels. Their undersides are painted to form ceilings. Form joint marks were removed by grinding and pointing.

Two-way reinforcing was used in the center bays of the building; but one-way reinforcing, perpendicular to the spandrel beams, was found more advantageous for outer bays, because of the relative positions of interior and exterior columns. In most interior areas, the minimum slab reinforcement required by the building code for shrinkage was larger than that needed for carrying the load.

Slab forms consisted of 4x8-ft plywood panels, braced with 3x4-in. ribs nailed to the undersides. Moved from floor to floor, occupying the same relative position at each level, the panels were re-used many times. They were butted over 4x6-in. stringers, so that there would be no difference in elevation between adjoining panels. Stringers were supported on shores, which rested on the floor below.

• Beams tailored to fit lumber—Beams were constructed around large openings and around the perimeter of each floor. The spandrels are of particular interest. They are wide and shallow —24x8$\frac{3}{4}$ in. Typical of the consideration given by the designers to use of standard-size lumber for forms, these dimensions enabled half a standard plywood sheet to serve as the soffit, a 2x3 (actual thickness 2$\frac{3}{4}$ in.) to form the inner side and a 1x10, the outer side.

Time was saved in bracing and plumbing this outer side, and random-length bracing was eliminated, by a simple construction. The 4x6 stringers supporting the spandrel forms were extended out, and a 2x10-in. plank was nailed to the top of the projection with the 10-in. side horizontal. Then, boards cut in the shape of a right triangle were nailed to the 2x10's and the outer side of the spandrel forms to brace and plumb the form side.

Another cost-cutting feature of interest is the spandrel stirrups. Having an extended top bar, these act also as negative reinforcement in the adjoining section of the floor.

• Underground garage—The flat-slab design of the above-grade portion of the building was also employed for a two-story garage in the basement. There, however, it was necessary to construct drop panels to take the shear. The flat-slab intermediate floor of the garage, which is 9 in. thick, carries a 60-psf live load, and the roof of the garage, which is 10 in. thick and is under a garden, carries a 100-psf live load.

There are 17,000 sq ft of floor area in the garage. Ramps lead from the street to the two underground floors.

• City code allows economies—Two other cost-cutting features of the design also worth noting were made possible by provisions in the Philadelphia building code that are not generally contained in the codes of other cities. One is a steel flue stack. In many municipalities, steel cannot be used alone for this purpose. But in Philadelphia, as utilized in the Flamingo Apartments, steel stacks are approved, but they must stand in a masonry-enclosed open area.

The second-money saving application of the code is the placing of fire towers inside the building. This is approved in Philadelphia when the vestibule leading to the enclosed stairs is provided with vent shafts, to remove smoke, heat and gases that might get into the tower from a fire.

John H. Graham, of Washington, D. C., was the architect, with John E. Sweet and Milton Schwartz, of Philadelphia, Pa., as associate and planning architects. Jacob Feld, of New York City, was structural and consulting engineer. Turner Construction Co. was the general contractor with William H. Gill as superintendent and F. D. Duffield as scheduling engineer.

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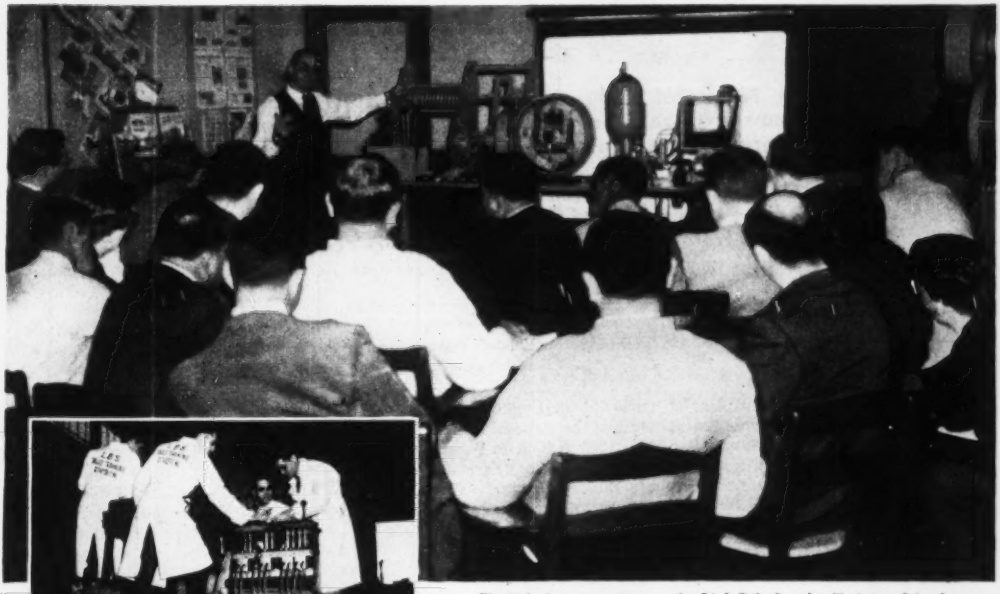

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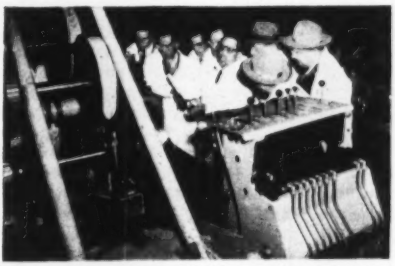

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Oak Ridge reports results on water decontamination study

• From Oak Ridge National Laboratory comes the best information now available on removal of radioactive materials from water by normal treatment processes.

• Progress is reported by three men now involved in radioactive waste disposal research of ORNL's Health Physics Division — two of them on loan from the U. S. Public Health Service.

Conrad P. Straub
Sanitary Engineer
Public Health Service

Roy J. Morton
Leader, Radioactive Waste Disposal Research Section

Oliver R. Placak
Senior Scientist
Public Health Service

AN EXPERIMENTAL treatment plant of 250-gpd capacity is being operated at Oak Ridge National Laboratory to find what success conventional processes have in removing radioactive contaminants from water supply (ENR Nov 29, 1950 p 104).

Pilot plant experience, plus laboratory jar test investigations, add to findings summarized here:

• Results in the pilot plant—Before plant studies were initiated to determine the effectiveness of waterworks processes in the removal of radioactive waste materials, two cold runs were made to evaluate the plant. Removal of turbidity was used as a parameter of effective operation. In all studies with radioactive materials, tap water was modified for use as a source of raw water by the addition of 100 ppm of turbidity in the form of a clay slurry.

In the cold runs, with the addition of relatively small amounts of alum and sodium hydroxide (0.65 gpg alum and 0.24 gpg NaOH), turbidity removals by coagulation and settling amounted to about 94% and filtration reduced the turbidity to under 0.1 ppm.

• Phosphorus-32—Results obtained in the operation of the pilot plant for the removal of radiosotopes singly and in mixtures, are summarized in Table I. In so far as the removal of P^{32} by orthodox water treatment units is concerned, the experimental plant results show high removals.

Coagulation and sedimentation accounted for 85% reduction and filtration increased the overall removal of P^{32} to 96–98%; the filters themselves effected a reduction of 79–88%. It was found also that most of the activity lodged in the filter was concentrated in the upper 6 in. of the filter medium. Treating the sand with hydrochloric acid (1 part conc. acid to 9 parts water) or sodium hydroxide (1 part 6 Molar NaOH to 9 parts water) removed most of the activity attached to the sand grains. This method of treatment may be of value in reducing high residual activities in filter sand.

The effluent from the filter averaged 37 disintegrations per minute per milliliter (dis/min/ml), which corresponds to 1.7×10^{-6} microcuries per cubic centimeter (μc/cc). Since the maximum permissible concentration for continuous exposure to P^{32} over an indefinite period of time is reported to be 2×10^{-4} μc/cc, it will be seen that the effluent contains about 10^{-1} of this concentration. In this run the initial concentration varied between 2,000 to 3,000 dis/min/ml.

• Iodine-131—When the removal of radioiodine (I^{131}) was investigated in the pilot plant it was found not to be removed to any great extent. Studies showed that less than 0.4% was removed, and that this could be demonstrated only by an analysis of the settled sludge. The addition of 4 ppm activated carbon had a beneficial effect, inasmuch as 15% of the activity was removed by coagulation, adsorption and settling while filtration removed an additional 11% of the activity, an overall reduction of 26%.

In these runs initial concentrations varied from 3,700 to 5,600 dis/min/-ml. Laboratory investigations, as will be shown later, indicated that the addition of small amounts of activated carbon, silver, or copper would increase I^{131} removals up to 78%, which is considerably greater than the removal obtained in the plant.

• Mixed fission products—A synthetic fission products mixture, simulating the elements and products remaining one month after a bomb blast, was prepared to study the effectiveness of water treatment plant procedures for the removal of fission products. The products and the quantities used were subject to choice based on the radioisotopes available at the time of the study. No effort was made to reproduce the specific chemical compounds produced during a bomb blast. Only the major constituents were included; minor and trace elements were omitted. Since gross removals, although of interest, would have little significance, radiochemical analyses were made of settled and filtered pilot-plant samples.

Materials comprising the mixture and the results obtained are indicated in Table II. These data show that coagulation and sedimentation accounted for a removal of 46% of the added fission products and filtration for 44 to 50% of the remainder, which gave overall removals of 70 to 73%. Some differences in removals were noted in the settled waste filtered through sand or Anthrafilt, but further studies should be conducted to substantiate these observations.

These data are of interest since they show differences in the removal of specific radioisotopes of varying chemical characteristics. On the basis of these findings, results of plant operation should be interpreted with care unless the specific radioisotope or radioisotopes comprising the mixture have been indicated and the conditions of the experiment are known.

• Findings from the lab—Many tests have been carried out in the laboratory with alum and iron coagulation utilizing standardized jar test techniques. In addition, special procedures such as phosphate coagulation, effect of pH on strontium removal, clay adsorption,

and others have been investigated. Table III lists the results obtained from a standardized series of jar tests in which alum or iron coagulation was used in studying the removal of a variety of radioisotopes.

These results illustrate the fact that wide differences in removal may be expected depending upon the kinds and quantities of chemical reagents used in the treatment process. In the removal of Y^{91} the alkaline agent used is of importance, in that a maximum reduction of 45% was obtained when NaOH was used and a maximum of 98% when Na_2CO_3 was employed. Somewhat similar results (effect of alkaline agent) are shown in the accompanying curves in which three alkaline agents were used to determine their effectiveness in the removal of radioactive materials from metal tank wastes.

Tracer type runs were made by R. A. Lauderdale with isotopes of cerium, strontium, yttrium, antimony, zinc, wolfram (tungsten), zirconium, and niobium. These were added to distilled water and the floc was formed by mixing variable amounts of $Ca(OH)_2$ and either KH_2PO_4 or Na_3PO_4 at a pH of about 11.5. The results obtained are given in Table IV. More extensive studies of the effect of the ratio (by weight) of Na_3PO_4 to $Ca(OH)_2$ and of pH on the removal of strontium produced the results illustrated in the second graph.

• Clay can help—Natural clays and soils have demonstrated an affinity for adsorbing certain radioactive materials from water solutions. This principle has been utilized in laboratory studies to determine their effectiveness in the removal of specific radioisotopes and mixtures of radioisotopes. Studies have indicated that cesium may be removed almost completely by passage through a column containing burnt clay. About 97% removal of strontium could be obtained by a similar procedure.

As shown in the results reported in Table III, variable amounts of clay to produce a turbidity influenced the removals of specific radioisotopes. Other studies on metal tank wastes showed that about 1,500 ppm of clay would

TABLE I

Removal of Radioisotopes—Conventional Water Treatment Procedure—Pilot Plant Results

Radio-isotope	Turbidity ppm	Alum dose gpg	Alkali dose gpg	Sodium silicate gpg	Carbon ppm	% reduction Settled	Filtered	Overall
			NaOH					
P^{32}	96–106	0.52–0.85	0.50–0.76	....	...	85	79–88	96–98
I^{131}	93	1.5	Lime–1.5	0.37	...	<0.4	<0.4	<0.4
I^{131}	102	1.5	Lime–1.5	0.42	4.0	16	11	26

TABLE II

Removal of Mixed Fission Products—Conventional Water Treatment Procedures Pilot Plant Results

Radioisotope	% of Mixture	Turbidity ppm	Alum dose gpg	Lime dose gpg	Sodium silicate gpg	% reduction Settled	Filtered	Overall
Total	100	104	0.9	0.8	0.4	46	44–50	70–73
Ru^{106}	15.9					75	0–30	75–82
Ce^{144}–Pr^{144}	12.1					55	46–51	76–78
Y^{91}	17.9					....	40–41	48–50
Sr^{90}	35.4					61	17–23	68–70
Zr^{95}–Nb^{95}	14.5					68	68–78	90–93
I^{131}	4.2					39	6–53	43–72

TABLE III*

Results—Standardized Jar Tests

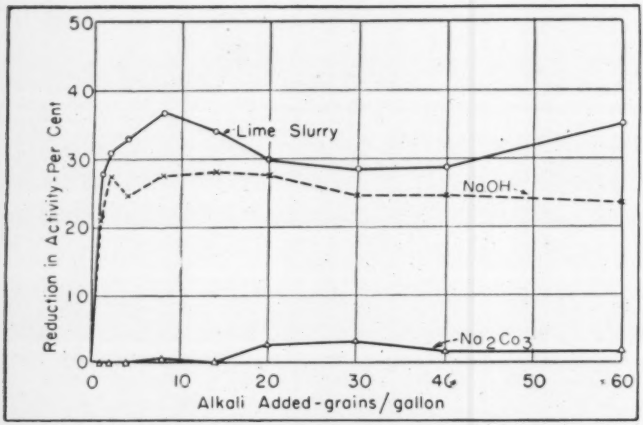
Isotope	pH	Range and kind of treatment: Turbidity added ppm	Alkalinity added ppm	Coagulant added ppm	% removed by coagulation and settling	% removed by coagulation, settling, centrifuging
Ce^{144}	7.2–9.6	52–1032			32–47	63–88
Ce^{144}	7.1–7.8	103	15–88	9–43	56–96	87–98
Y^{91}	6.6–7.3	52–1032			17–70	17–82
Y^{91}	6.6–8.5	103	15–46 (as Na_2CO_3)	9–43	83–95	89–98
Y^{91}	6.8–8.1	103	14–88 (as NaOH)	9–43	5–46	16–45
Sr^{89}	6.9–7.6	52–5160			2–51	7–52
Sr^{89}	6.7–7.9	103	15–88	9–43	6–20	6–22
Mixed Fission Products	7.4–7.6	50–800			12–38	28–64
Mixed Fission Products	7.2–8.8	103	17–51	17–51	52–76	61–84
I^{131}	6.9–9.0	103	13–39	9–39	0–10	0–10
I^{131}	6.9–9.0	103	13–39	9–39 (plus 4 ppm $AgNO_3$)	46–71	62–75
I^{131}	6.9–9.0	103	13–39	9–39 (plus 5–15 ppm carbon)	68–73	78
P^{32}	6.8–8.8	103	13–39	9–26	88–96	97–99

* Table III is a composite of all data and is designed to show concisely the wide variations obtainable. To show the precise effect of such variables as kind and amount of coagulant, alkalinity, turbidity, and isotope, a number of specific tables would be essential.

TABLE IV

Results of Phosphate Coagulation Studies

Isotope	Coagulant	Mg/liter coagulant	% removal
Ce^{144}	KH_2PO_4	200	99.8
	Na_3PO_4	120	99.9
Sr^{89}	KH_2PO_4	100	81.3
	Na_3PO_4	240	97.8
Y^{91}	KH_2PO_4	100	99.9
Sb^{126}	KH_2PO_4	100	66.1
	Na_3PO_4	120	67.4
Zn^{65}	KH_2PO_4	50	99.6
W^{185}	KH_2PO_4	200	10.7
Zr^{95}	KH_2PO_4	100	99.5
Nb^{95}	KH_2PO_4	100	99.2



REMOVAL CURVES—Graph left shows removal of metal waste actively by alkaline precipitants. Graph right gives percent of Sr^{++} removed from solution at pH values ranging from 9 to 12.

be required to produce removals of at least 80%.

• **Decontaminating small volumes**—Some study has been made of the use of the newer synthetic anion and cation exchange materials, particularly in monobed units. This principle was utilized by R. A. Lauderdale and A. H. Emmons (JOURNAL, American Water Works Association, May, 1951), as the final step in a decontamination unit which included passage of the radioactively contaminated solution through beds of steel wool, burnt clay and activated carbon.

This combination of processes, which incidentally has been suggested for the emergency treatment of small volumes (to about 30 liters) of water contaminated with radioactivity, resulted in the reduction of the initial concentration from 2.5 microcuries per cubic centimeter ($\mu c/cc$) to less than 10^{-4} $\mu c/cc$, which is equivalent to a removal in excess of 99.996%.

• **Concluded from findings**—Care should be exercised in applying the data on removal of radioactive materials to particular situations unless the contaminating radioactive substances are known and the treatment techniques employed parallel the reported procedures. Current treatment processes must be evaluated with respect to the removal of individual or combinations of radioisotopes, and to the conditions under which these radioisotopes may occur. If these prove ineffective new processes must be developed.

All treatment results should be considered in relation to the maximum permissible concentration values formulated by the Subcommittee on Internal Dose of the National Committee on Radiation Protection. Percentage removals, as such, are of little significance. It is the final concentration of contaminating material that remains after treatment that determines the success or failure of the process investigated.

Progress is being made. As data become available from future research the findings will be released from time to time. It must be remembered that the data reported herewith are based on present knowledge. They represent the best information now available but are subject to change as newer developments occur.

• **Pilot plant design**—The 250 gpd water treatment plant is designed to help establish basic criteria for building larger pilot plants or full-scale waterworks, and for suggesting modifications in operating procedures.

It includes facilities for mixing, coagulation or flocculation, sedimentation and rapid sand filtration. There are stainless steel mixing, flocculation and settling basins, and ten lucite rapid sand and Anthrafilt filter columns.

Tap water is fed to the first of two mixing basins from a constant-head tank controlled by a solenoid valve. Since a variety of reagents may be added, two mixing basins connected in series are used. The flow enters through a vertical 2-in. diameter feed tube at one end of the basin and discharges through a 1-in. dia horizontal outlet at the opposite end.

Mixing is accomplished by means of a motor-driven stirrer. Each basin provides a theoretical detention time of 5 min when the plant operates at the 250 gpd rate, but the detention time at this flow rate may be varied to cover the range of 2 to 5 min through the use of false bottoms of sand and paraffin.

In recent runs the chemicals were fed as follows: turbidity in the form of a local clay slurry, radioisotope or radioisotope mixture, and lime to the feed tube of the primary mixing basin; sodium silicate into the discharge line between the primary and secondary basins; and alum near the outlet of the secondary basin. The clay slurry and sodium silicate were fed to the plant through a Harvard roller displacement pump; the other materials were fed by gravity from constant-head carboys.

The tap water-chemical mixture discharges into the coagulation or flocculation basin, which is 18 in. in diameter, has a water depth of 10½ in. and is provided with a baffle near the discharge side of the basin. Use of false bottoms as indicated for the mixing basins, will permit detention times varying from 25 to 60 min. Flocculation is accomplished by a motor-driven stirring mechanism consisting of three pairs of horizontal blades pitched at an angle of 45 deg and mounted on a vertical shaft. Measurements of the speed of rotation (16 rpm) indicate a peripheral velocity of approximately 0.83 ft/sec. To prevent destruction of the floc, the outlet to the settling basin, a trough 4 in. wide, was made relatively large.

The settling basin, revamped from a 55-gal drum, is about 22 in. in diameter with a variable water depth controlled by a telescopic outlet tube. A baffle 17 in. wide and 15 in. long, placed 4 in. beyond the influent to the tank, diverts the flow toward the bottom of the tank and helps to reduce short circuiting. To facilitate sludge

concentration the unit is provided with a right conical hopper. By means of the telescopic outlet tube detention times may be varied from 2 to 4.5 hr. Valves are provided to permit withdrawal of sludge or supernatant.

• **Measuring radioactivity**—A thin-walled Geiger-Mueller tube has been attached to the discharge line for measuring the radioactivity of the effluent. This activity is recorded automatically on a chart. However, unless corrections are made for the build-up of activity on the surface of the discharge line, erroneous results will be obtained.

Effluent from the settling basin discharges into a circular tank 28 in. in diameter with a water depth of 11½ in. A circular saw-tooth weir, composed of 72 teeth, discharges to an effluent launder. One of the notches in this weir is blocked off from the effluent launder and discharges directly to a sampling container. In this way, composite samples proportional to the flow into the unit are obtained. For a flow of 250 gpd this tank provides 2.7 hr additional detention time.

The settled water is pumped to a constant-head filter feed tank from a funnel outlet in the bottom of the composite sampling tank. This is accomplished by a small laboratory centrifugal pump located at a level to maintain positive head at the pump inlet. The constant head tank is 5 ft long, 1 ft wide, and has 10 orifices spaced along the long side at a height of 2 in. above the bottom of the tank. A constant head is maintained on the orifices by an overflow tube which empties to the composite sampling tank. The orifices discharge into funnels placed in the top of each filter. At the present time ⅛-in. diameter orifices are used, but others are available to permit variations in the rate of feed to the filters.

• **Filters**—Lucite tubing 1⅞ in. inside diameter and about 6 ft long was used for the filter columns. Limited ceiling height precluded the use of greater lengths. Each column contains 9 in. of graded gravel and 24 in. of graded sand or Anthrafilt. At the present time 10 filter columns are in use, each containing a different medium based on effective size and uniformity coefficient characteristics.

The first filter column contains local sand; filters 2 to 8, inclusive, contain synthetic mixtures of sand with a constant uniformity coefficient of 2.0 and variable effective sizes increasing in intervals of 0.1 mm., ranging from 0.35 to 0.95 mm.; filter 9 contains Anthrafilt with an effective size of 0.75 mm. and a uniformity coefficient of 1.8 and filter 10 contains Anthrafilt with an effective size of 1.7 mm. and a uniformity coefficient of 2.

Because of the limited ceiling height, a maximum freewater head of 3 ft can be applied to the filter. This shortens the filter runs somewhat. Filter effluents are collected in 20-liter carboys for purposes of sampling and overall rate-of-flow determinations. A constant rate flow device is being developed for use on the effluent end.

Work described in this article was performed under contract No. W-7405—Eng.—26 for the Atomic Energy Commission.

Water studies are just a part of radioactive waste research

The current program of waste disposal studies in the Health Physics Division at Oak Ridge Natural Laboratory was organized in 1948. A basic sanitary engineering approach was adopted, and a broad and cooperative research and development program was developed. (ORNL is operated for the Atomic Energy Commission at Oak Ridge, Tenn., by Carbide and Carbon Chemicals Company, a division of Union Carbide and Carbon Corporation.)

The U. S. Public Health Service and the Tennessee Valley Authority have cooperated with the Atomic Energy Commission and the laboratory in providing qualified sanitary engineers and research scientists of various specialties and experience.

General purpose of the program is to conduct field surveys and experimental investigations which will better define the problems of radioactive waste disposal and aid in the development of measures for the alleviation or control of such problems at Oak Ridge or elsewhere. Particular emphasis has been given to the study of waste liquids containing radioactive materials. A primary objective is the development of procedures that will help to appraise and to minimize any hazards or problems that might develop in connection with sewage and waste disposal plants or water supply systems. Both laboratory and pilot plant studies are included in the program.

A specially design laboratory and pilot plant building is under construction and will become available about November, 1951.

Also, the Public Health Service is increasing its participation in the program by assignment of additional personnel, acceptance of responsibilty for technical sponsorship of the studies on water decontamination, and the establishment of an advisory committee to guide this sponsorship. Membership of this advisory committee includes representatives from the Public Health Service, the Atomic Energy Commission, the waterworks profession and the armed services.

The entire program of the Radioactive Waste Disposal Research Section includes the following general types of activities:

• **Water decontamination**—Laboratory and pilot plant experimental studies, survey and sampling studies of existing water plants, and cooperation in appraisal and adaptation of military water treatment procedures.

• **Sewage treatment**—Laboratory and pilot plant studies on behavior of radioisotopes in sewage treatment processes and extent of concentration or removal by sewage materials.

• **Other wastes**—Methods of decontamination of liquid radioactive wastes, particularly treatment of large volumes of low activity liquids by sanitary engineering processes; handling and disposal of sludges and residues.

• **Surface water and related studies**—AEC-TVA Ecological Study Project; controlled studies of aquatic organisms; downstream background and periodic sampling surveys; rainwater analysis and air sampling.

• **Instrumentation**—Laboratory and pilot plant measurements and control; surface and ground water surveys; continuous monitoring of water and waste streams at peacetime permissible levels of radioactive contamination; and water supply appraisal and protection for civil defense.

• **Laboratory techniques and methods**—Improvement and adaptations of methods for radiochemical analyses, autoradiographic analyses, and radioisotope sample counting techniques, refinements in estimating energy of radiation, self-absorption of samples, geometry and scattering corrections, efficiency of counting instruments, etc.

• **Related cooperative projects**—In addition to the studies of military water treatment procedures and the AEC-TVA ecological study, these include geological, ground water, meteorological studies, etc.

• **Educational activities**—Training of graduate students, research participants, and other personnel assigned to the section; participation in class training programs and information conferences with visitors; preparation of lectures and papers and attendance of local information meetings.

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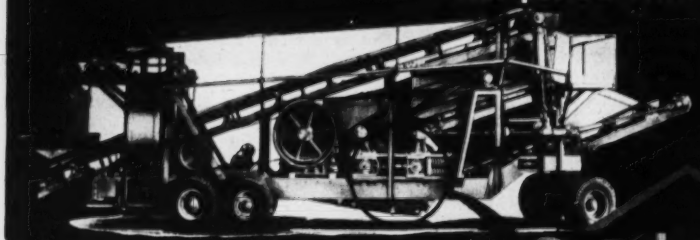

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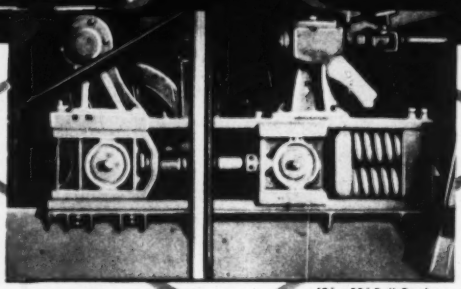

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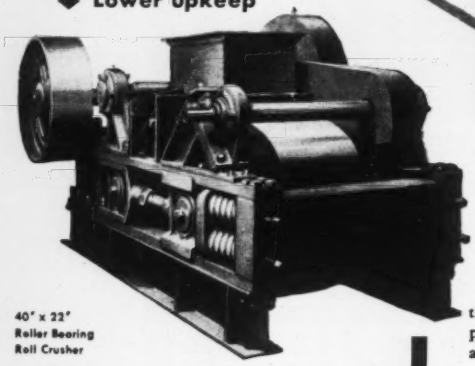

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Phenols in industrial wastes can be destroyed chemically

PHENOLS can be oxidized. Any one of three oxidants—chlorine, ozone or chlorine dioxide will do the job. How well each will work and how the costs compare may be estimated from the accompanying typical reaction curves.

These curves and the data from which they were drawn are presented in "Phenol Wastes—Treatment by Chemical Oxidation," a research report just released by the Ohio River Valley Water Sanitation Commission. Findings resulted from studies conducted by Armco Steel Corp., Wallace and Tiernan Co., Inc., the Ozone Processes Division of the Welsbach Corp. and Mathieson Chemical Corp., cooperating with the Ohio State Department of Health and the U. S. Public Health Service, and under direction of the Ohio River Valley Water Sanitation Commission.

Each of the oxidants studied in this cooperative investigation was put to test on coke-plant waste—first in the laboratory, then in a 2 gpm pilot installation built by Armco at its Hamilton, Ohio, by-product coke plant.

Each of the three competitive chemical firms participating took its turn at laboratory and pilot plant, working on the same waste.

• **Further results**—Significant findings for ammonia-still wastes were:

1. Each oxidant materially reduced biochemical oxygen demand (more than 60%).

2. Chlorine treatment requires pH adjustment to the 7-10 range. Ozone and chlorine dioxide work best when added to waste at pH 11.5 with no further pH control.

3. Temperatures above 45 C in chlorination may cause chlorates, requiring heavier chlorine dosage.

4. Ammonia demand must first be satisfied if the necessary breakpoint potential is to be reached in chlorination; ammonia present has no apparent effect on ozone or chlorine-dioxide treatment.

5. Chlorination requires complete oxidation if chlorophenols are to be avoided. Partial treatment without chlorophenol formation is possible with the other two oxidants.

6. Residual chlorine must be several hundred ppm to remove phenol or reduce it to low concentration. Granular activated carbon will remove excess chlorine. Residual ozone or chlorine dioxide can be controlled to within less than 1 ppm, requiring no after treatment.

7. Chlorine adds chlorides to the waste in an amount equal to the dose; chlorine dioxide adds about 1.5% chlorides; ozone adds none.

8. There is no apparent advantage in using chlorine and chlorine dioxide in series, but used together they cut down the amount of chlorine dioxide needed.

9. Two needs still exist: Solutions to certain plant design problems; more information on analysis for phenols.

10. Studies on other wastes showed that chemical oxidation will work as well on wastes of other industries.

• **Background**—ORSANCO instigated the study and encouraged industry's participation ($55,000 worth). But first, it delved deeply into all previously recorded data on phenol-waste treatment. Chemical oxidation was chosen as the most promising field for further development.

Early encouragement came from C. C. Ruchoft of the U. S. Public Health Service Environmental Health Center in Cincinnati. Then came industry.

Armco's installation provided a waste with phenol concentration ranging 28 to 332 ppm. Its BOD was 300 to 400 ppm and pH was fixed just above 11.0.

Oxidation took place in a tower, 28 ft in diameter and 18 ft high. Waste was added at the top, removed at the bottom. Near the bottom were diffuser tubes for feeding ozone and chlorine-dioxide gases. Chlorine-dioxide solution was added in the feed line to the tank, at the top. Caustic could be added at any level for pH control.

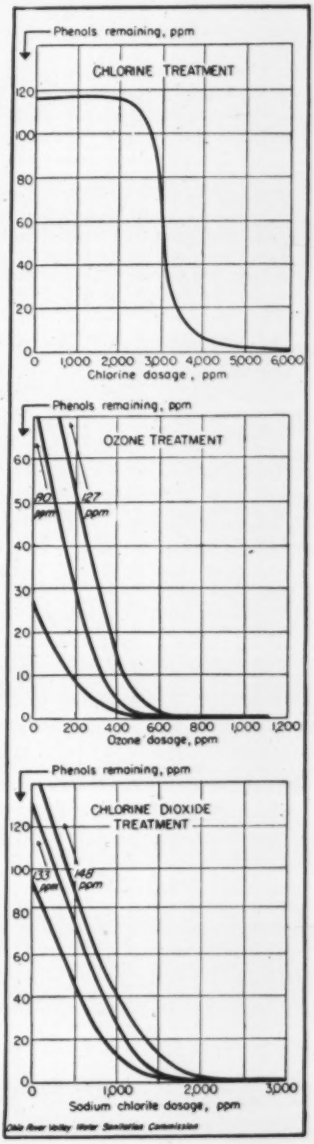
Chlorine was added to wastes at the chlorinator, then passed through two 55-gal reaction tanks before going to the tower.

Samples were taken at various depths of solution in the tower; at its inlet and outlet; and at points of chemical feed.

• **A new method**—At the start of studies need existed for a phenol analysis method that would be fast, permit reproducible results and measure chlorophenols. A method sensitive in the low range of concentrations was sought—and found.

Michael Dannis, Armco research chemist came up with a variation of the AAP (aminoantipyrine) method of phenol test. His method, called DAAP (distilled aminoantipyrine), involves a distillation step but takes only 45 min in contrast to 18 hr for the Gibbs technique and is sensitive to 0.1-0.5 ppm under defined conditions. DAAP was used as control technique, with Gibbs as a check.

Over a score of persons from the various industries and public agencies participating in the research took an active part in studies. John E. Kinney, sanitary engineer for ORSANCO, coordinated the project. Edward J. Cleary is the commission's executive director and chief engineer.



TYPICAL CURVES—phenol oxidation.

BOOK REVIEWS

The ages of dirt moving

TOOLS OF THE EARTHMOVER—YESTERDAY AND TODAY—by J. L. Allhands. 362 pp. Sam Houston College Press, Huntsville, Texas. $5.

Mr. Allhands, a real oldtimer in big dirt operations, has combined his contracting experience with his interest in the historic to produce a book that many earthmovers and construction scholars will be happy to have.

The former will find much that is nostalgic—pictures and drawings of wheel scrapers, Fresnos, steam tractors and dump carts. The latter will find that Mr. Allhands searched diligently for information on the origin of many types of earthmoving equipment.

Drawings of medieval earthwork schemes are reproduced, as are old patent sketches and descriptions. Another source freely tapped is the advertisement page of many an early construction publication. Photo files of western railroads, as well as of our old contractors, yielded more material. Material about more recent years comes primarily from the manufacturers.

"Tools of the Earthmover," is essentially a picture book although in places the text amplifies data quite satisfactorily. The author is at his best in discussing tractors, scrapers, carts and wagons. In other sections, he tends to let the illustrations and their titles speak for themselves.

About ground water

THE CONSERVATION OF GROUND WATER—By Harold E. Thomas. 327 pp. McGraw-Hill Book Co., New York 18 and London. $5.00.

THE WATER SITUATION IN THE UNITED STATES WITH SPECIAL REFERENCE TO GROUND WATER—By C. L. McGuinness. Adapted from a report for the President's Water Resources Policy Commission. Geological Survey Circular 114. Obtainable from the Geological Survey, Department of the Interior, Washington 25, D. C. Limited free distribution.

Harold E. Thomas' study of the ground water situation in this country is made up of case histories of the major areas where underground sources are used largely for domestic and industrial water supply. It is designed to bring home to the general public the seriousness of the current situation and should prove to be very useful for that purpose, as this book is attractively and easily read. In addition, it contains a large amount of factual information that will be of great value to practicing engineers.

The general hydrologic principles that apply to ground water problems are discussed in the opening chapter. There follows a long chapter in which conditions in each principal region or city that uses a ground-water supply are briefly summarized. There are 79 of these summary statements, which include observations as to whether the source is being depleted or can be expanded.

Subsequent chapters discuss the ground water problems resulting from land occupancy, the nation's increasing water requirements, and current deficiencies and future needs for effective ground water development. The concluding chapter, written by Abel Wolman, discusses better groundwater management.

Mr. Thomas was granted a leave of absence from the Geological Survey to make this study for the Conservation Foundation.

Even more factual information of interest to engineers in water-supply work is given in the Geological Survey study just published as Circular 114. It is based on information assembled for the President's Water Resource Policy Commission. Included is a summary of the current water situation by states. A still larger report is available for inspection at Geological Survey Library in the General Services Building in Washington.

More about water

WATER OR YOUR LIFE—By Arthur H. Carhart. 312 pp. J. B. Lippincott Company, Philadelphia, Pa. $3.50.

There is a lot of information in this book about water and the growing need for more water to sustain our expanding industries, but there also are numerous strongly biased opinions that are not as objective as the book purports to be. Mr. Carhart is what F. C. Merriell of the Colorado River Water Conservation District characterizes as a "wildlifer." He views with distrust any change in the status quo of a river.

Mr. Carhart devotes considerable space to discussion of the operations of the Army Engineers and the Bureau of Reclamation under such chapter heads as "Too Many Cooks" and "Our Rivers Be Dammed." He cites the well-known overlapping of jurisdiction and the resulting conflicts, but his account of the operations of these two agencies is hardly dispassionate.

Possibly Mr. Carhart considered a certain amount of exaggeration necessary to dramatize his main point, namely, the need for a well developed national plan for the conservation and use of our water resources.

Building officials' manual

MODERN BUILDING INSPECTION—Second Edition, edited by R. C. Colling, Hal Colling, R. P. Cravens and R. M. Fox. 646 pp. Building Standards Monthly Publishing Co., Los Angeles 13, Calif. $10.

Written by a group of experts on building construction, the new edition is designed for use as a handbook for building officials. It may also serve as a textbook for architectural and engineering courses. Topics covered include: Building department organization, fees, records, plan checking, field inspection and public relations; building valuation, structural requirements and fire resistance; legal responsibility of officials; and building-code enforcement.

For building estimators

BUILDING ESTIMATOR'S REFERENCE BOOK—Eleventh edition, by Frank R. Walker, 1,780 pp. Frank R. Walker Co., Chicago. $12.00.

Mr. Walker, who first issued this encylopedia of estimating data in 1915, calls the current edition his "Swan Song." It is re-written, revised and reset, with its information brought as up-to-date as is possible in these days of fluctuating costs.

In chapter organization the book treats nearly 30 building elements, examples being foundations, concrete masonry, rough carpentry, glazing, sheet metal work, and electrical work. Within chapters it details conventional as well as special or patented material and methods, first discussing their applications and limitations, then giving bases for quantity estimates (such as: a cubic yard of cement mortar will yield 648 square feet of half-inch plaster coat). In some cases, prevailing unit-costs for materials are given, but more generally not.

On the labor side of cost estimating, Walker breaks down operations and states how much time each trade will take to perform unit operations. Labor hourly rates, of course, are given only in examples.

A useful feature of the book is the set-up it presents for estimating each operation. Hours required are stated

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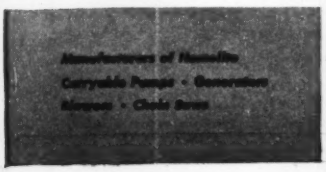

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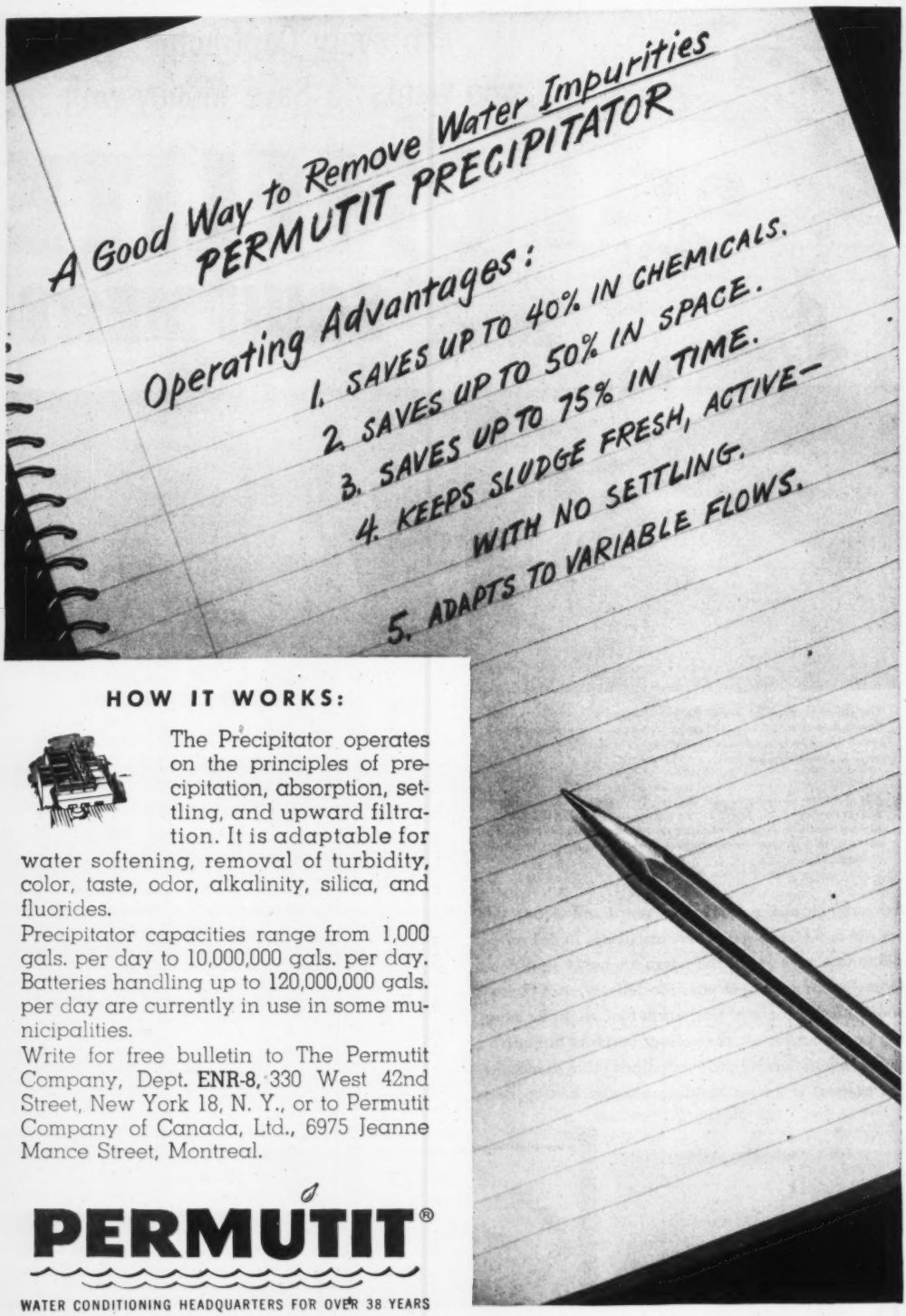
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WATER CONDITIONING HEADQUARTERS FOR OVER 38 YEARS

and blanks are left for hourly rates and totals. Similar setups are presented for material costs, and drawings of whole cost-estimate sheets are presented for various types of work.

A companion book, "The Vest Pocket Estimator," also is published by Walker. Containing 220 pages, it presents in tabular form, material quanitities and labor hours for estimating various classes of building construction.

Foundations and cofferdams

FOUNDATIONS OF STRUCTURES—By Clarence W. Dunham. 679 pp. McGraw-Hill Book Co., New York 18, Toronto and London. $7.50.

UNDERPINNING: ITS PRACTICE AND APPLICATIONS—By Edmund A. Prentis and Lazarus White. Second Edition. 374 pp. Columbia University Press, New York 27. $10.00.

COFFERDAMS—By Lazarus White and Edmund A. Prentis. Second Edition. 311 pp. Columbia University Press, New York 27. $10.00.

In view of the importance of foundations it is strange that so few comprehensive texts on that subject have been published in this country. Possibly that is due to the scope and thoroughness of the classic text by Jacoby and Davis, "Foundations of Bridges and Buildings" which first appeared in 1914, and the smaller but for those days equally comprehensive text "Modern Underpinning" by Lazarus White and Edmund A. Prentis, which came out in 1917.

Clarence W. Dunham's "Foundations of Structures" has the completeness of coverage that gives promise of providing a much needed success—or to the Jacoby and Davis test.

The opening chapters undertake to present what has been learned about soil mechanics in the past 25 years as it applies to foundations. Subsequent chapters take up the various types of foundation problems normally met in the construction of walls, bridges and buildings. The illustrations for these chapters have been selected with great care and do much to amplify the text.

One subject not fully covered in Prof. Dunham's book is underpinning, presumably because of the availability of a well known text on that subject, "Underpinning: Its Practice and Applications."

The new edition of this book, like its predecessors, is a first-hand record of experience of two leaders in the field of difficult foundation work that has broadened progressively in the more than 30 years since their first little book appeared. Much new material has been added to the revised text, including a chapter on raising and moving heavy structures.

Another closely related text by the same authors that now is available in an enlarged edition is "Cofferdams." It also is based on the authors' practical experience.

Notes on Pamphlets, Reprints and Educational Films

ONE WAY OF ELIMINATING WASTE from house construction is outlined in a 54-page pamphlet, "The Modular Method in Dwelling Design," prepared by the Housing and Home Finance Agency. Though intended primarily for architects, the publication is expected to be of practical value to builders and materials manufacturers. Profusely illustrated with construction details and floor plans, it explains how modular coordination saves time, labor and material by eliminating cutting and fitting on the job and introduces economies in manufacturing processes, distribution and stocking of building parts. The pamphlet may be obtained from the Superintendent of Documents, U. S. Printing Office, Washington 25, D. C., for 30 cents.

New Engineering Books

SIMPLIFIED MECHANICS AND STRENGTH OF MATERIALS—Harry Parker, 275 pp. John Wiley & Sons, New York, 16, N. Y., Chapman & Hall, London. $4.00.

HYDRAULIC TRANSIENTS—By George R. Rich. 260 pp. McGraw-Hill Book Co. New York 18, Toronto and London. $7.00.

AIR CONDITIONING IN SUMMER AND WINTER—Revised second edition. By Richard E. Holmes. 352 pp. McGraw-Hill Book Co. New York 18, Toronto and London. $5.75.

THE CONSERVATION OF GROUND WATER—By Harold E. Thomas. 327 pp. McGraw-Hill Book Co., New York 18, Toronto and London. $5.00.

CIVIL DEFENSE IN MODERN WAR—By Augustin M. Prentiss. 429 pp. McGraw-Hill Book Co., New York 18, Toronto and London. $6.00.

THE MUNICIPAL YEAR BOOK 1951—588 pp. The International City Managers' Association, Chicago. $10.00.

INTRODUCTORY SOIL MECHANICS AND FOUNDATIONS—By George B. Sowers and George F. Sowers. 284 pp. The Macmillan Co. New York 11, Toronto and London. $4.75.

ELEMENTARY PROBLEMS IN ENGINEERING—By H. W. Leach and George C. Beakley. 263 pp. The Macmillan Co., New York 11, Toronto and London. $3.50.

SOIL TESTING FOR ENGINEERS—By T. William Lambe. 165 pp. John Wiley & Sons, New York 16; Chapman & Hall, London. $5.00.

MOLESWORTH'S HANDBOOK OF ENGINEERING FORMULAE—1,672 pp. E. & F. N. Spon, London. The Macmillan Co., New York 11. $6.50.

ADVANCED FLUID DYNAMICS AND FLUID MACHINERY—By R. C. Binder, 426 pp. Prentice-Hall, New York 11. $8.00.

BITUMINOUS CONSTRUCTION HANDBOOK—284 pp. Barber-Green Co., Aurora, Ill., U. S. A. $2.00.

VIBRATION AND SHOCK ISOLATION—By Charles E. Crede. 328 pp. John Wiley & Sons, New York 16, Chapman & Hall, London. $6.50.

THE STRUCTURE AND MECHANICAL PROPERTIES OF METALS—By Bruce Chalmers. 132 pp. The Royal Aeronautical Society, London. John Wiley & Sons, New York 16. $3.50.

Reports and Pamphlets

THE BED-LOAD FUNCTION FOR SEDIMENT TRANSPORTATION IN OPEN CHANNEL FLOWS—Technical Bulletin No. 1026. Soil Conservation Service, Washington, D. C.

TENTATIVE STANDARD SPECIFICATIONS FOR FERROUS SULPHATE—American Water Works Assoc., 500 Fifth Ave., New York 18. Price 15c.

TENTATIVE STANDARD SPECIFICATIONS FOR AMMONIUM SULPHATE—American Water Works Assoc., 500 Fifth Ave., New York 18.

COLD WEATHER READY MIXED CONCRETE—National Ready Mixed Concrete Assoc., 1325 E St., N.W., Washington 4, D. C.

BUILDING, CIVIL ENGINEERING AND PUBLIC WORKS COMMITTEE, INTERNATIONAL LABOR ORGANIZATION—Report I, General Report, $0.50; Report II, Welfare in the Construction Industry, $0.25; Part III, Season Unemployment in the Construction Industry, $0.25, International Labor Office, 1825 Jefferson Place, N.W., Washington 6, D. C.

(Continued on page 48)

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(Continued from p. 47)

LONG-TIME TESTS OF CONCRETES AND MORTARS EXPOSED TO SULPHATE WATERS—Technical Bulletin 194. Agricultural Experiment Station. University of Minnesota, Minneapolis, Minn.

SYMPOSIUM ON THE IDENTIFICATION AND CLASSIFICATION OF SOILS—Special Technical Publication No. 113. American Society For Testing Materials, 1916 Race St., Philadelphia 3, Pa. $1.65.

ORIGIN AND ACHIEVEMENTS OF THE BOARD OF WATER SUPPLY CITY OF NEW YORK—Published by the board at 120 Wall St., New York City.

HIGHWAYS WITH A NARROW MEDIAN—Bulletin No. 35, Highway Research Board, Washington 25, D. C.

1950 SUPPLEMENT TO BOOK OF ASTM STANDARDS—Part 1, Ferrous Metals. American Society For Testing Materials. 1916 Race St., Philadelphia 3, Pa. $350.

1950 SUPPLEMENT TO BOOK OF ASTM STANDARDS—Part 3, Cement, Concrete, Ceramics, Thermal Insulation, Road Materials, Waterproofing, Soils. American Society For Testing Materials, 1916 Race St., Philadelphia 3, Pa. $3.50.

THE PROFESSIONAL ENGINEER AND A FREE SOCIETY—By Thomas R. Camp. Reprinted from the Journal of the Boston Society of Civil Engineers. Obtainable from the author, 6 Beacon St., Boston 8, Mass.

TRANSPORTATION POLICY—Transportation and Communication Department, Chamber of Commerce of The United States, Washington 6, D. C.

THE TWENTY-FOURTH ANNUAL HIGHWAY CONFERENCE OF THE UNIVERSITY OF COLORADO—Circular No. 24, Engineering Experiment Station, University of Colorado, Boulder, Colo.

WOOD BOX COLUMNS AND THEIR DESIGN—Engineering Experiment Station Series No. 79, Virginia Polytechnic Institute, Blacksburg, Va.

THE ESTIMATION OF EXTREME FLOOD DISCHARGES BY STATISTICAL METHODS—Reprinted from the Proceeding of the New Zealand Institution of Engineers, Wellington, New Zealand.

APPLICATION OF COLD-MASTIC ASPHALT COMPOUNDS TO THE SEALING OF JOINTS & CRACKS IN RIGID PAVEMENT—Bulletin No. 19, The Engineering Experiment Station University of Kentucky, Lexington, Ky.

STUDIES OF THE USE OF PERVIOUS FENCE FOR STREAMBANK REVETMENT—Report No. A-70.1, Hydrodynamics Laboratories, California Institute of Technology, Pasadena, Calif. United States Dept. of Agriculture, Soil Conservation Service, Washington 25, D. C.

STEEL BUTT-WELDING FITTINGS—ASA B16.9-1951. The American Society of Mechanical Engineers. 29 West 39th St., New York 18, N. Y.

REPORT ON THE WATER RESOURCES OF WESTCHESTER COUNTY, NEW YORK—Westchester Water Works Conference, Water Resources Committee. County Office Bldg., White Plains, N. Y.

FLOOD DAMAGE AND FLOOD CONTROL ACTIVITIES IN ASIA AND THE FAR EAST—United Nations Flood Control Series No. 1. Prepared by the Bureau of Flood Control. Economic Commission or Asia and the Far East. Bankok, Thailand.

REFUSE COLLECTION AND DISPOSAL—A Bibliography. Public Health Bibliography Series, No. 4, Federal Security Agency, Washington 25, D. C.

UNIVERSITY RESEARCH POTENTIAL—A Survey of the Resources for Scientific and Engineering Research in American Colleges and Universities. Engineering College Research Council of the American Society for Engineering Education. Edited by John I. Mattill, Secretary, Mass. Institute of Technology, Cambridge 39, Mass.

PROCEEDINGS OF 1950 SOIL MECHANICS CONFERENCE—Technical Memorandum No. 19. Associate Committee on Soil And Snow Mechanics, National Research Council of Canada, Ottawa, Ont.

CAPACITY OF BOX INLET DROP SPILLWAYS UNDER FREE AND SUBMERGED FLOW CONDITIONS—Technical Paper No. 7, Series B. St. Anthony Falls Hydraulic Laboratory, University of Minnesota, Minneapolis, Minn. $0.50.

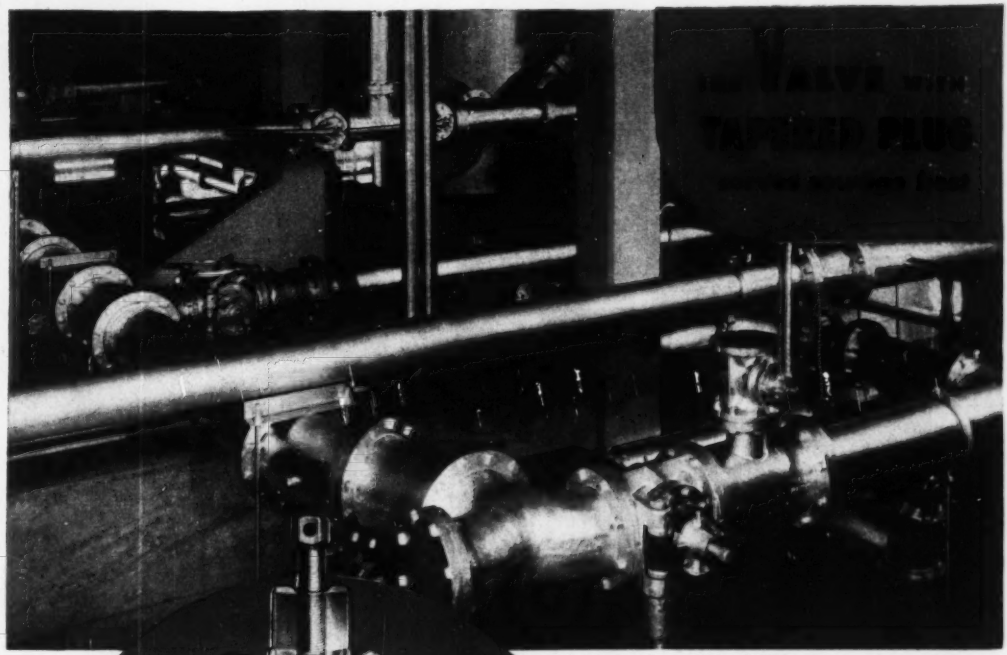
HYDRAULIC DESIGN OF THE BOX INLET DROP SPILLWAY—Technical Paper No. 8, Series B. St. Anthony Falls Hydraulic Laboratory, University of Minnesota, Minneapolis, Minn.2 $0.80.

CLEVELAND TODAY . . . TOMORROW—The general plan of Cleveland. Cleveland City Planning Commission, Cleveland, Ohio.

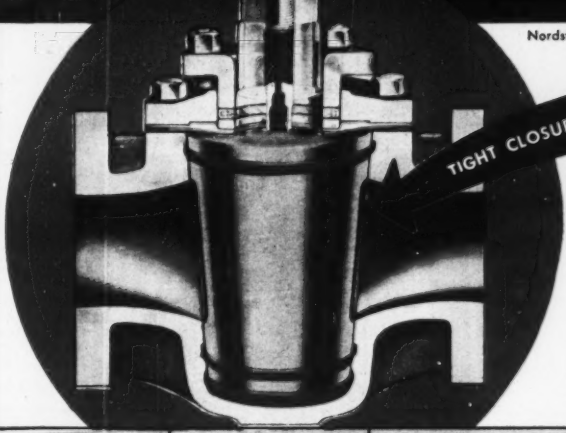
UNIFORM FACE TO RACE DIMENSIONS FOR FLANGED CONTROL VALVE BODIES—Tentative Recommended Practice. Instrument Society of America, 921 Ridge Ave., Pittsburgh 12, Pa. $.25.

POLLUTION PATTERNS IN THE OHIO RIVER—1950—Ohio River Valley Water Sanitation Commission, 414 Walnut St., Cincinnati 2, Ohio.

TURNER TURNPIKE—Oklahoma Turnpike Authority, State Armory Building, Oklahoma City 5, Okla.



Nordstrom valves in sludge feed lines



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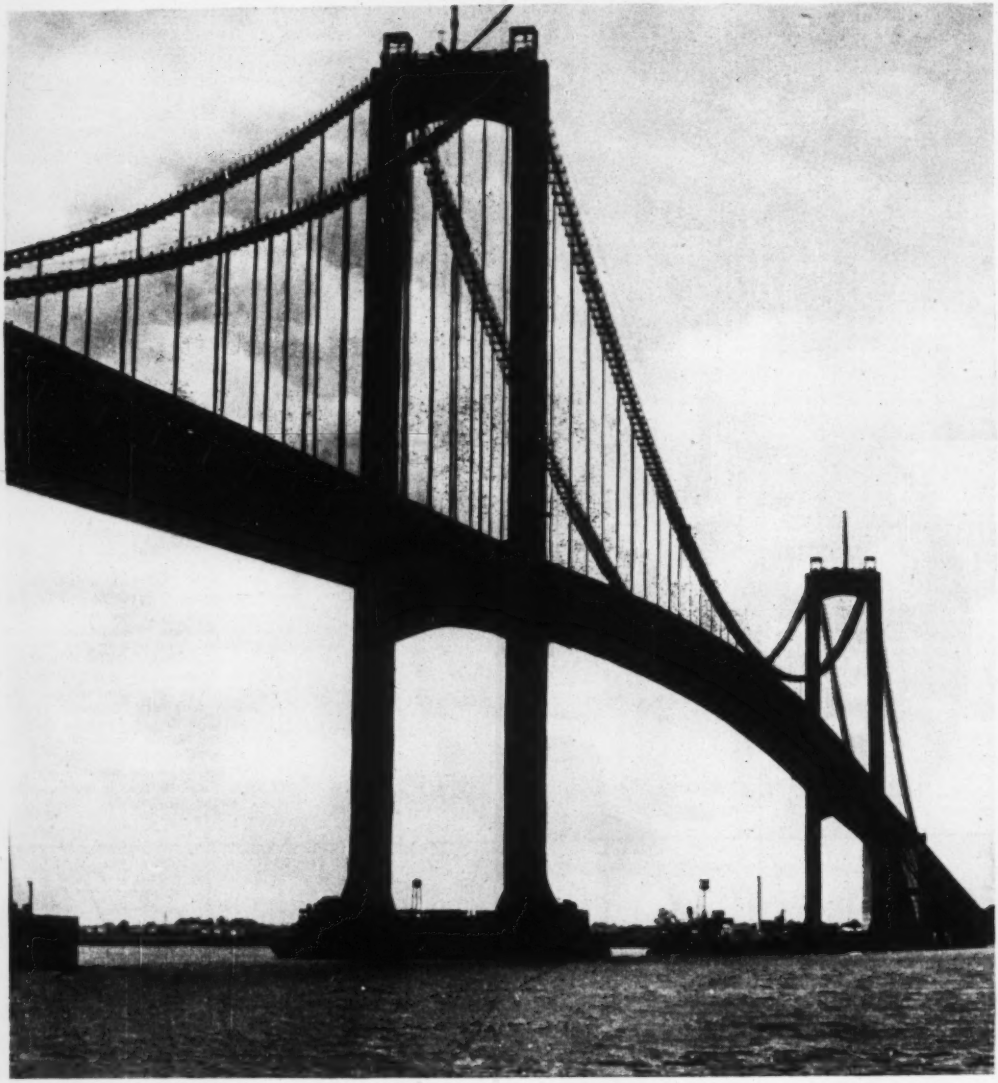
NEW DELAWARE



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Opening August 16, the new 10,765-foot Delaware Memorial Bridge connecting southern New Jersey and Delaware will have an estimated future traffic of 4,000,000 vehicles a year.

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On this project four coats of paint—32,000 gallons—were used. The first coat, the metal primer, resists rust chemically. The following two field coats are formulated to reinforce the shop coat and the final topcoat is made to resist weathering and abrasion. Years of exhaustive laboratory and field testing shows that the four-coat system gives about three times the service life of a two-coat system.

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READER COMMENT

Marine stadium engineers

Sir: In your July 26th issue you described the Marine Stadium at Jones Beach.

We would like to call your attention to the fact that we were the structural engineers for the design of this project. The firm of Skidmore, Owings & Merrill is mentioned as Architect-Engineer. However, they were engaged only to supervise the work, since the original architect, William Haugaard, died before the construction work began.

FRED N. SEVERUD
Severud-Elstad-Krueger
New York, N. Y.

Floating wharves

Sir: The floating wharf at Palua, on the Orinoco (ENR July 12, p. 35) brings to mind that port facilities similar, but larger, have existed at Manaos, Brazil since 1903 and are still functioning with practically no changes and little expense for maintenance.

It may be noted that conditions at Manaos are somewhat similar to those at Palua. Manaos, some 900 mi. up the Amazon, is situated near the mouth of the Rio Negro. The annual fluctuation between high and low stages is 40 ft, the river being three miles wide.

The first floating wharf is about 350 ft long by 75 ft wide, anchored 400 ft offshore from a permanent wharf. The floating wharf is composed of a number of steel cylinders floating in a horizontal position, with saddles having flexible seats for a framing of steel box girders supporting a system of steel joists which carry a timber decking. This float also supports the head towers of three cableways.

The pull on these cableways (50 ft above the deck) induces a careening moment on the float which is counteracted by a lower tier of buoyancy cylinders, completely submerged, under the main cylinders on the shore side of the float. Pipes extend from the float deck into these submerged cylinders to permit the verification of the water ballast in them and the adjustment of such ballast by means of a hand pump.

It may be noted that, due to a solution of vegetable matter in the waters of the Rio Negro, thin film is formed on anything submerged therein, and this film constitutes an excellent protective coating against oxidation, so efficient that chains, cables or steel plates that have been submerged for years show no sign of corrosion. Hence, as far as we know, it has never been necessary to remove and dock any of these floating cylinders.

The float is held in position by chains, each chain being attached to heavy cast iron anchors so shaped that the drag upon them tends to imbed them more firmly in the river bottom which is of fine sand.

The offshore chains come up through the float deck on the inshore side and the inshore chains come up through the deck on the offshore side, all chains passing around sheaves supported by the structural framing of the float. Similar chains and anchors secure the float against endwise displacement. These chains are not fixed permanently to the float, but pass over drums on manually operated ship windlasses and at suitable locations are weighted with supplementary weights to ensure sufficient sag to prevent the chains fouling steamers of 30 ft draft.

Shortly after the cableway float went into operation a second float without cableways, but of dimensions identical, was attached to the original float's upstream end. And a year later a separate float, 80 ft wide by 600 ft long, was installed.

The general design of Manaos harbor work was the joint work of the original concessionaires, Baron Rymkiewicz, and his chief engineer, Dr. Antonio de Lavandeyra. To these eminent engineers long since passed away, this writer owes a debt of gratitude for the assistance they gave him in obtaining a foothold in his life's work and encouraging him to exercise in his early days whatever inherent talents he was endowed with.

From an impersonal standpoint it might be considered remarkable that after 40-odd years the engineers of Bethlehem Steel Corp. developed a design for Palua which so closely parallels that existing at Manaos which, in all likelihood, they never knew existed.

CHARLES J. SEIBERT
6310 8th St. N.W.
Washington 11, D. C.

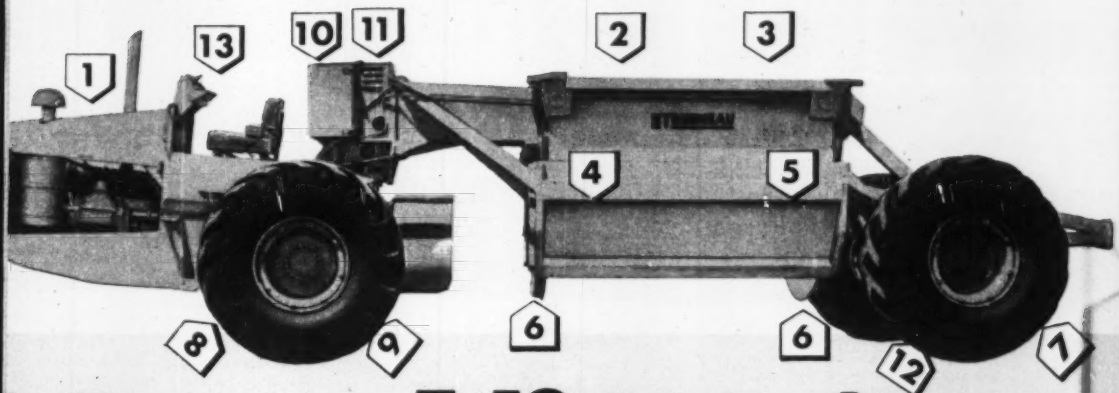
Guadalajara population

Sir: I read in your "Perspective Section" of May 10, an interesting report of Guadalajara City, but it is necessary to amend the population census in the following manner:

Monterrey, 1950, census 331,771
Guadalajara, 1950, census 378,423

JORGE MATUTE Y REMUS, Rector
University of Guadalajara, Mexico

Here's the BOTTOM-DUMP DIRTMOVER for YOU...



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2 Tournahopper carries up to 18 cubic yards . . . has 18-ton capacity. Giant, low-pressure rubber tires cushion loading and road shocks.

3 Fast swing, less spillage . . . dragline or shovel operator shoots for a big 7′ x 9′10″ target . . . has low, 8′6″ loading height.

4 Dump doors lift high . . . leave a big bottom opening approximately same as top. . . rocks, sticky material or dirt dumps fast. Everything that goes in the top easily comes out the bottom.

5 "Clamshell" doors wipe clean as they swing up and out . . . open full width or partially for controlled dump. No dangling gates.

6 21″ ground clearance under hopper permits fast dump and also turn over deep windrows. Opened doors clear 42″ and with prime mover in 90° turn position, you can swing to clear 42″ boulders. Clearance under front axle is 17½″.

7 Giant 21.00 x 25, tapered-bead tires all around operate at pressures as low as 30 lbs. give extra flotation, minimize rutting in soft ground.

8 51% of loaded weight on front drive tires means plenty of traction in spongy, wet going. No "extra" front wheels to steer or bog down.

9 Exclusive, torque-proportioning differential automatically delivers 4 times the tractive power to Tournapull drive wheel on firmest footing.

10 Positive power steer gives safe, accurate control . . . swings prime mover without use of final drive . . . "walks" to firmer footing out of mudholes.

11 Prime mover's 90° turns give exceptional maneuverability. Has 15′8″ turn radius . . . less than half of the machine's 34′ overall length.

12 4-wheel, multiple-disc air brakes . . . 3,836 sq. in. braking surface . . . give safe use of the C Tournapull's 35 m.p.h. hauling speeds.

13 Finger-tip electric controls, comfortable foam rubber seat, full visibility all mean less operator fatigue . . . no end-of-shift slow-down . . . more trips a day . . . more profit for you.

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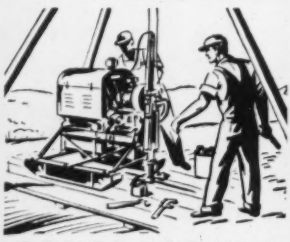

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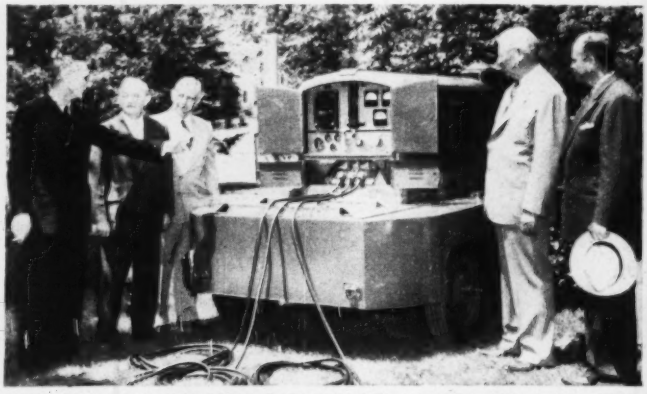


STANDBY POWER FOR WATER—Fire Chief Verne Griffith of Birmingham, Mich., explains the city's new diesel-powered standby generator set to Mayor Chad M. Ritchie and City Manager Don C. Egbert, as Harry B. Coen, vice-president of General Motors Corp., and Col. A. D. Howell, Michigan's assistant director of civil defense look on. Although Birmingham (population 17,000) has never had a major power failure, civil defense officials of the city—only 15 miles from the industrial center of Detroit—strongly recommended standby power for their water system. They have it now—a portable generator set capable of meeting emergency water requirements. Putting the set into action is simple and fast. First, it is towed to one of the city's seven pumping stations. Second, it is connected to the switch gear panel by three cables; and third, it is started by pushing a button. Total equipment—one truck, one wrench; total personnel—one man; total time—about 15 minutes, depending on the distance to the pumping station.

Street widening pays

G. H. Herrold, Director
City Planning Board, St. Paul, Minn.

To say that widening a street for one block is of no value is not realistic. In San Francisco when they made a parking garage of Union Square the city widened the street on the four sides of the park 10 ft to provide an additional lane of traffic along the park side of the block.

We also have examples in St. Paul. Wabasha Street was widened for one block along the Court House, and Fourth Street also was widened so that a moving car can pass between a street car and a parked car.

Our board recommended the widening of Cedar Street 6 ft. This would make it possible to have a 45-ft pavement or five lanes of traffic. If we widen the street 20 ft we will have an 8 ft retaining wall to support the ground which rises to a height of 10.9 ft 10 ft from this wall, the difference in elevation between Wabasha and Cedar at mid-block being 17 ft. The purpose of widening this street 20 ft was to make it possible to park diagonally or vertically. This calls for a special ordinance giving special privileges to this block. It has been proven that parallel parking is the safer way to park.

There are a number of buildings, principally in downtown St. Paul, that have corner cutbacks. These are very desirable from the standpoint of the building itself as they give 3 facings instead of two. This is very valuable for advertising purposes. As the intersections must carry twice the traffic of the street, cutting back corners facilitates right hand turns and makes it possible for a vehicle to round a corner without getting into another lane of traffic.

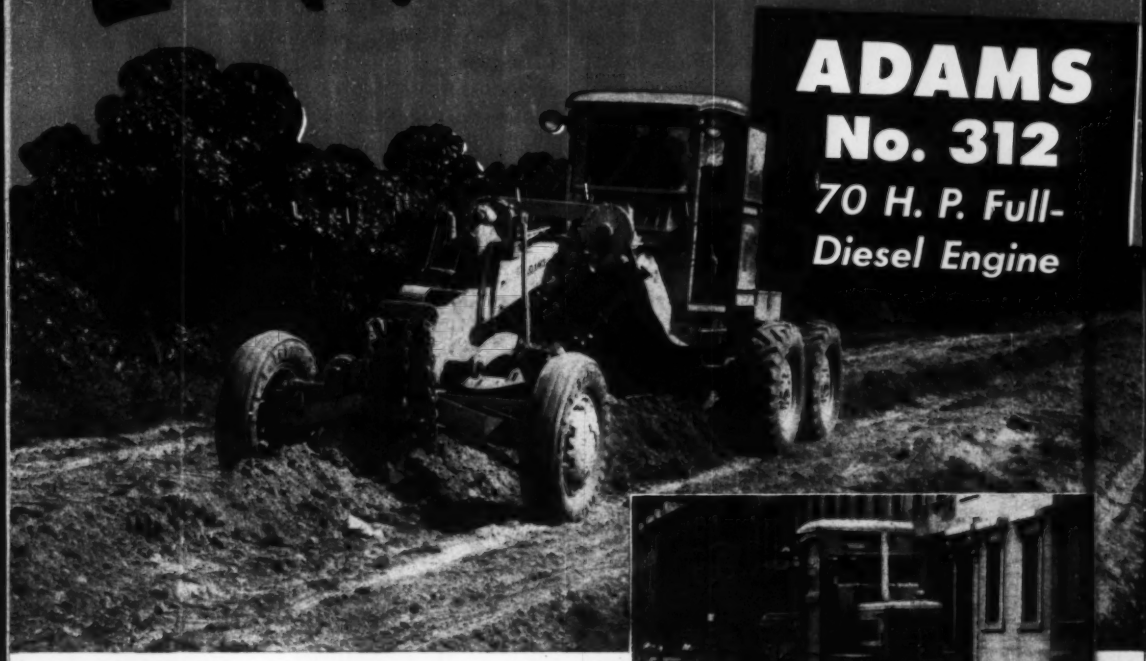
There has been criticism of taking frontage off of Wabasha Street which is the most valuable, but these critics overlook the fact that a corner lot is more valuable on a wide street than on a narrow one downtown.

Cities seek to solve their sewerage problems

• **Canton, Ohio**—This city is faced with the need of chlorinating raw sewage before discharging it until a sewer trunk under construction is completed. Local pressure has been brought to bear to force the city into

(*Continued on page 59*)

Look! A Medium-Priced Motor Grader with a lot of Capacity....



• The new Adams Motor Grader No. 312 is made to order for municipalities and contractors who are looking for a good utility machine at a moderate price.

Here is a husky 70 hp. motor grader with all of the weight and performance-ability that you bought in heavy-duty machines several years ago. From deep ditch cutting to high bank sloping—scarifying, sub-grading, fine finishing, mixing, back-filling, snow plowing, etc.—the new Adams No. 312 will do a surprising amount of work with real speed, efficiency and economy.

Before you buy any motor grader in the medium-price class, by all means investigate the great new Adams No. 312. See your local Adams dealer—or write for illustrated literature.

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Make your next motor grader an **ADAMS**

nothing slow about this crawler

"BIG RED" DIGS IN. The International TD-24 dozes through tough going faster, pushes bigger bladefuls farther, moves more pay-dirt per day. It's the "Champ" for sure!

Read what makes International's TD-24—the Big Red "Champ"—finish ahead of the field!

Man or machine, it takes speed and strength and stamina to take on all comers and leave 'em trailing behind. It takes guts and power to spare to be the "Champ."

In a human, it means running a faster race, hitting a harder ball, fighting a tougher fight. In the TD-24, it means doing more work in less time than any other crawler on the market.

More speed—8 forward and 8 reverse speeds up to 7.8 mph for faster time cycles on the job.

More power—148 maximum drawbar horsepower—to take a bigger load on the scraper, a bigger bite on the blade and move dirt faster, easier, cheaper.

More flexibility—synchromesh shifting "on the go"—instant change up or down one speed without declutching—Planet Power steering for pivot turns, feathered turns, turns with power on both tracks.

The TD-24 gets in and out and back in again faster—moves more dirt each time—makes more money for its owner every working day.

It's the Big Red "Champ" any way you look at it.

Come in and look. Ask your International Industrial Distributor for the low-down. Find out about his fast-moving parts and service setup, which will keep your International power on the job for years to come. You'll be a TD-24 man from then on in!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

From Start to Finish... YOU'RE TIME AND MONEY AHEAD with Firestone TIRES

WHEN you start a job, you want to get it done in the shortest possible time at the lowest possible cost. The kind of tires you use has a lot to do with both.

When you buy Firestones, you pay no more than you do for other tires. But you GET more — more rubber in the treads . . . You get double-thick, cut resistant sidewalls. You get four extra plies that protect the Gum-Dipped cord bodies, which can be retreaded again and again. And you get more service from your Firestone Dealer or Store.

Add up these advantages. They mean more hours of service . . . less delays and downtime. You're time and money ahead with Firestone Tires on your equipment.

Enjoy the Voice of Firestone on radio or television every Monday evening over NBC

Copyright, 1951, The Firestone Tire & Rubber Co.

ALWAYS SPECIFY FIRESTONE TIRES WHEN BUYING NEW EQUIPMENT

this temporary treatment, as delays have slowed construction on the new line that will parallel an old broken line carrying sewage to the disposal plant south of the city. Contractors blame quicksand and rock for construction delays; the by-pass is due to be completed in about two months.

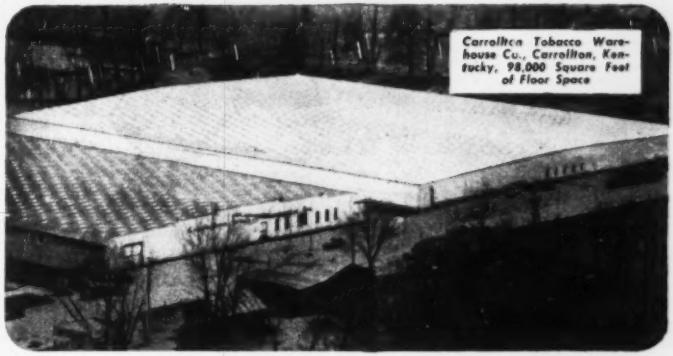
• **Syracuse, N. Y.**—The city engineering department has begun a cost survey on construction of a single sewage disposal plant for Syracuse and three nearby towns. The common council directed City Engineer Nelson F. Pitts to estimate the cost of a trunk line connecting the proposed facilities of the west end sanitary district with the city's present disposal structure. The Onondaga Lake Purification Commission requested the estimate as a basis on which to determine whether combined or separate plants would be more practicable and economical for the city and towns. Commissioner of Public Works F. F. Harmon is requesting an appropriation to clean every sewer main.

• **Worcester, Mass.**—Gov. Paul A. Dever of Massachusetts has signed a bill authorizing Worcester to borrow $1,000,000 for sewer construction. The new law extends until Jan. 1, 1953, borrowing authorizations for 1946 and 1947 amounting to $3,000,000. The original authorization expired last June 4. All but a little more than $1,000,000 of the $3,000,000 was used to rebuild the Worcester sewage treatment plant.

(*Continued on page 60*)

IMPROVING NEW YORK—A $2,000,000 street reconstruction on E. 42nd St., New York, while temporarily tying up traffic, will be a great improvement in the United Nations headquarters neighborhood.

How Carrollton Tobacco Warehouse SAVED ON MATERIAL and ERECTION COST, with STEELCRAFT STEEL BUILDINGS



Steelcraft "Custom-Engineering" Can Solve *Your* Storage Problems

Carrollton Tobacco Warehouse Company needed a huge, specially designed warehouse—one built to meet the unusual requirements of their business. And they wanted it in a hurry.

Steelcraft engineers were given the assignment. The job required thorough understanding of tobacco storage problems and complete knowledge of special features peculiar to tobacco warehouse construction such as ventilating and skylighting. The result—a precisely adapted, permanent structure at an amazingly low cost.

Interior view of warehouse, showing skylight, roof, and column construction

This is a typical example of how Steelcraft engineers will analyze your building needs and recommend a structure to meet your exact requirements. No matter how large or small, simple or complex your problem is, Steelcraft engineers have the "know-how."

STEEL Craft REG. U.S. PAT. OFF

Contact us or have your architect, engineer or contractor write us for full information.

STEELCRAFT MANUFACTURING CO.
Rossmoyne, Ohio (In Greater Cincinnati)

WRITE TODAY — USE COUPON BELOW

STEELCRAFT MANUFACTURING COMPANY
9198 Blue Ash Road, Rossmoyne, Ohio
(In Greater Cincinnati)

☐ Please send engineer to survey my building requirements.

☐ Please send me information on complete line of Steelcraft Metal Buildings.

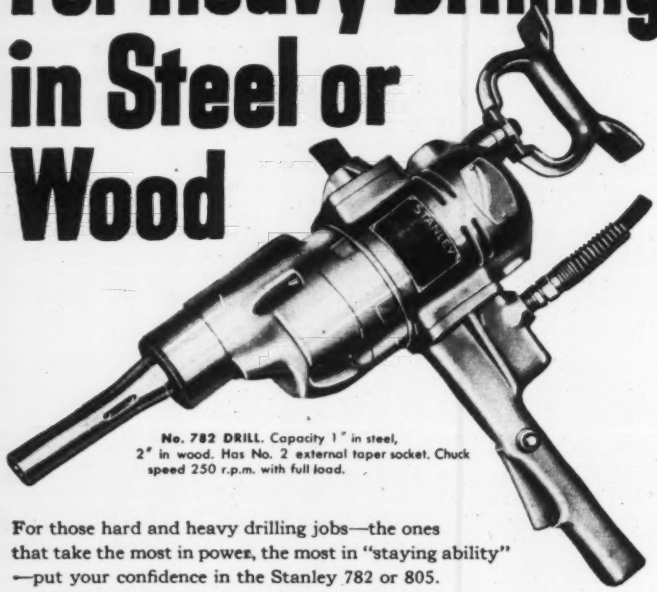
NAME _____

COMPANY _____

BUSINESS ADDRESS _____

CITY _____ ZONE _____ STATE _____

For Heavy Drilling in Steel or Wood



No. 782 DRILL. Capacity 1" in steel, 2" in wood. Has No. 2 external taper socket. Chuck speed 250 r.p.m. with full load.

For those hard and heavy drilling jobs—the ones that take the most in power, the most in "staying ability" —put your confidence in the Stanley 782 or 805.

These powerful electric drills have specially heat-treated nickel steel gears and anti-friction bearings throughout. Advanced design makes the most efficient use of their surplus power to give long, dependable service—as performance records prove. Stanley drill stand quickly converts either drill to a sturdy drill press.

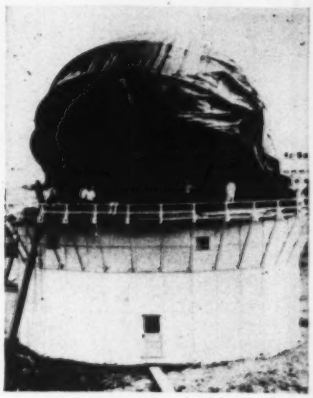
Next time your distributor's salesman calls, ask for details on these Stanley drills. For descriptive literature, write Stanley Electric Tools, 438 Myrtle St., New Britain, Conn.

No. 805 DRILL. Capacity 1¼" in steel, 2½" in wood. Has No. 3 internal taper socket. Chuck speed 125 r.p.m. with full load.

STANLEY

Reg. U.S. Pat. Off.

HARDWARE • TOOLS • ELECTRIC TOOLS • STEEL STRAPPING • STEEL



ENTER THROUGH THE AIRLOCK—and you are in the attic of this giant rubber balloon that roofs a General Electric built house for radar equipment now under way in Syracuse, N. Y. Balloon measures 167 feet around and 36 feet high. Withstanding wind velocities of 125 miles per hour, at an inflation of one half a pound of pressure, the radome protects the radar antenna from wind, snow and ice without hindering its operation.

Toledo finds contractors loaded with jobs

Toledo street repair and paving is being slowed because contractors who generally do work in the city have loaded up with outside jobs.

Only 10 of the 140 authorized projects for the year have been completed, including two undertaken in partnership with the Ohio Highway Department.

Of the sixty projects now under contract, work has been started on only one half, and is lagging on others.

The city's program totals $2,000,000 of which only $491,000 is let.

• **Sewer service charges**—Seven cities with population of more than 500,000 now levy sewer service charges, the International City Managers' Association, Chicago, has reported. These cities are New York, Cincinnati, Minneapolis, Buffalo, Cleveland, Detroit and Philadelphia. Approximately 278 cities over 10,000 population also charge for sewer service, according to the association. Chief basis for levying such charges are: Against quantity of water consumed; fixed percentage of water bill; number of plumbing fixtures; number of sewer connections, or a uniform rate. The revenues from this source are earmarked for maintenance, management, operation and repair costs of the sewer systems.

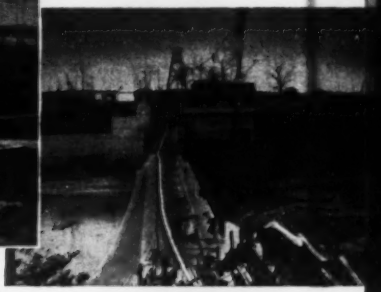
Have you tried PUMPCRETE® on your B-V-D's?

Rex Pumpcrete has proved the lowest cost concrete placement method on hundreds of bridges, viaducts and dams. *For Example:*

BRIDGES Pouring bridge piers in mid-stream is a fine example of cost-cutting Pumpcrete use. Pipe line is run out and into the piers. No heavy road needed to support trucks. No danger of preparatory structures being "washed out." When one pier is completed, pipe is merely extended to the next one. It is also used to pour bridge deck.

VIADUCTS—Pumpcrete is usually ideal for viaduct work because it can handle the job without disrupting traffic and can pump to a height of 120', eliminating need for towers. Here it delivers concrete to a viaduct pier from location on the opposite side of a rail yard. Pipe is laid in a shallow trench under the tracks.

DAMS Time after time Pumpcrete proves to be the most economical method for pouring dams and spillways. Preparatory costs are held to a minimum, and a steady, large volume flow of concrete is assured. On this job a single pipe line and light cableway handled all concreting for a 500-foot spillway and multiple arch bridge above.



PUMPCRETE
REDUCES DIRECT LABOR COST

Concrete is transported, elevated and placed in one operation. No buggying needed.

PUMPCRETE
REDUCES PREPARATORY COSTS

Pumpcrete and pipe line flexibility eliminate need for many access structures in road building and maintenance... trestling and scaffolding, etc.

PUMPCRETE
REDUCES "DEAD TIME"

Pumpcrete delivers concrete steadily... promotes smooth, steady job progress with no interference between various crews.

PUMPCRETE
REDUCES NON-PRODUCTIVE MOVING TIME

No need to move mixing equipment from place to place. Pipe line placement permits spotting of Pumpcrete in the one best location for concrete placement.

Ask your local Rex Distributor to give you the details of the many advantages of concrete by pipe line. Or, if you prefer, write to Chain Belt Company, 1633 W. Bruce Street, Milwaukee 4, Wis.

CHAIN BELT REX COMPANY®

CONSTRUCTION MACHINERY...

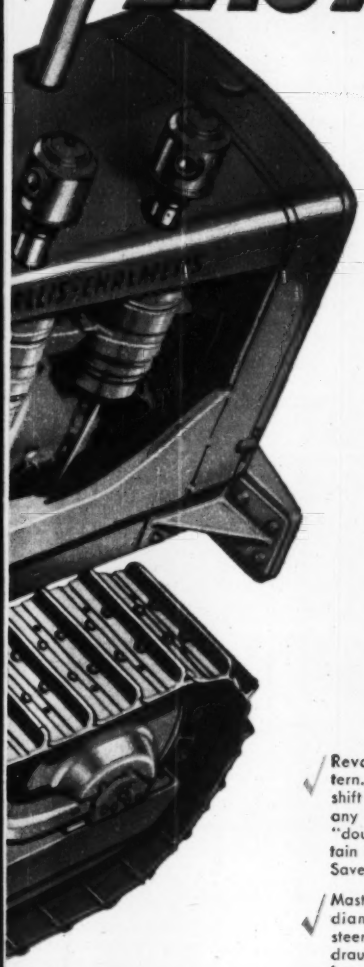
Here's what WE mean by

- DESIGNED FOR YOUR JOB
- BUILT TO "TAKE IT"
- EASY TO OPERATE
- EASY TO SERVICE

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

EASY TO OPERATE



Operators have long awaited the greater handling ease and comfort now brought to them by this new line of Allis-Chalmers tractors.

Conveniently located controls respond to the slightest effort . . . and are operated in the same familiar way — nothing tricky to "catch on to." There is new shifting ease, new seat and platform comfort, full visibility.

Because the operator's job is easier—takes less effort—he can maintain a steady pace, do a better job throughout his shift . . . day after day.

Look over some of the many reasons why this NEWEST, FINEST TRACTOR LINE ON EARTH is easy to operate . . . as well as being built to "take it," easy to service and entirely new in performance. Then get the full story from your Allis-Chalmers dealer.

- √ Revolutionary shift pattern. A quick, one-lever shift from any forward to any reverse speed. No "double" shifting to obtain high reverse speeds. Saves time and effort.
- √ Master clutches with large diameter plates, and steering clutches with hydraulic or mechanical boosters, require less effort. All control linkage is equipped with anti-friction needle bearings.
- √ Steering brakes are self-energizing for both forward and reverse travel. Pedals adjustable to operator.
- √ Quick electric starting on diesel fuel from operator's seat. Tractors go to work faster. No fuel waste or engine wear by needless idling to avoid restarting.
- √ Throttle control, conveniently located, easy and positive (stays put).
- √ Roomy, *adjustable* cushioned seat with wide arm rests. Operator works in real comfort with either front or rear-mounted equipment.
- √ Full visibility. Tapered hood, narrow cowl and clean rear-end design provide clear view of front and drawbar work.
- √ Ample leg room. Clean platform. Foot rests for added comfort on larger models.
- √ Built-in primer system (standard) makes starting quick and easy even in sub-zero weather.

40.26 drawbar hp.
11,250 lb.

70 drawbar hp.
18,800 lb.

*

102 drawbar hp.
27,850 lb.

Hydraulic Torque Converter Drive
175 net engine hp.
41,000 lb.

The Newest, Finest Tractor Line on Earth!

Like the Hunter and His Dog . . .

they Go Together

ALL-WHEEL DRIVE

and ALL-WHEEL STEER

What makes it easy for the front truck to ride the bank? . . . ALL-WHEEL DRIVE!

What keeps the rear truck running smoothly down on the road? . . . ALL-WHEEL STEER!

On jobs like this, and hundreds of others, this pair of exclusive Austin-Western features works as a team to do better work, and more of it. A profusely illustrated catalog which tells the whole story is yours for the asking.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.

Subsidiary of Baldwin-Lima-Hamilton Corporation

Austin Western

BALDWIN · BLH · LIMA-HAMILTON

FIELD AND OFFICE

Which sewer first: formula solves problem

Priority ratings for storm sewers in Buffalo, N. Y., are set by a formula that indicates each job's drainage value per dollar invested.

Buffalo had a common ailment: many sewers needed and too few dollars. The formula devised measures benefit per dollar for each individual sewer needed, and thus assigns an equitable priority rating to each.

A 1938-40 study resulted in a comprehensive plan that recommended construction of 126 miles of trunk and branch sewers in sections subject to serious flooding during storms. This whole plan wouuld cost about $60,000,000 at 1951 prices.

Just those projects felt to be "urgently needed"—on the basis of experience and complaints received—would cost some $17,000,000. And Buffalo's Sewer Authority has legal right to borrow money by bond issues up to a total of only $15,000,000 outstanding at a time. At this rate it will take 26 years to complete the high priority jobs alone.

As a means of scheduling the projects in an order fundamentally fair to all, General Manager John W. Johnson and engineers of Buffalo's Sewer Authority worked out this formula:

$$K = 1{,}000 \frac{a \sqrt{b} c}{de}$$

where:

The 1,000 factor is used to avoid a small decimal figure; it may be eliminated.

a is the drainage area in acres—the area to be relieved directly and indirectly by construction of a given relief project

b is its relative assessed valuation (ratio of the average assessed valuation of the area benefited to the average assessed valuation of the entire city of Buffalo)

c is the degree of development (ratio of present population to ultimate expected population of the area served.)

d is the average percentage of adequacy of existing sewers which serve the area

e is the estimated cost of the relief project including trunk, subtrunk, branches, laterals and inlets.

According to Mr. Johnson, the priority rating K should be qualified by many intangible factors determined by engineering experience. Among these factors: the relationship of a project in question to other public works such as street paving and, in Buffalo's case, construction of the New York State Thruway, proposed to pass through some poorly sewered sections of the city.

Using this formula, the Sewer Authority has listed 56 separate projects in the order of their priority. Listing includes the estimated cost of each, status of plans, probable dates of construction start and completion. The schedule runs through 1977.

Basing its contention on this evidence that progressive development will take a long time, the authority has held that possibilities for an increased rate of construction should be studied. Suggested solutions to the money problem include state-aid for improvements relating to the Thruway and assessments against property holders for financing improvements in their districts.

The margin for issuance of new bonds is now about $5,700,000, of which $2,300,000 has been earmarked for sewage works expansion.

Inflow, not pressure, controls well pumpage

Provincetown (Cape Cod) pumping station avoids sea water contamination of its wells through pump flow control based on inflow to wells rather than pressure in distribution mains.

Excessive pumping during periods of great demand easily could draw salt water into the wells located in North Truro, Mass., near the tip of the Cape. A special control device limits pumpage, assuring a withdrawal rate that never exceeds inflow to the wells. Flow is adjustable up to the established limit.

The flow controller electrically positions the throttle of a diesel engine that drives the pump. Further details of the installation are obtainable from the manufacturer—The Foxboro Company, Foxboro, Mass.

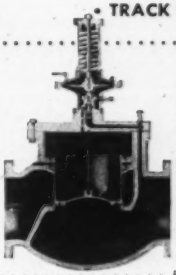
Do you find the reports in this department of help to you? ENR is happy to pass these suggestions along to other readers. So, if you have any ideas that you think would be of interest to others, send them to ENR's Field and Office Editor at 330 W. 42nd St., New York 18, N. Y. We will pass them on. And remember, Engineering News-Record pays for published items.

YOU CAN *Automatically* maintain a UNIFORM WATER LEVEL

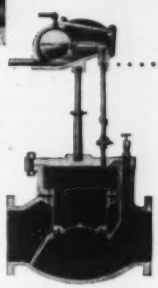
with GOLDEN ANDERSON

"Cushioned" ALTITUDE and FLOAT VALVES

for
- RESERVOIRS
- ELEVATED TANKS
- COAGULATING BASINS
- MIXING CHAMBERS
- TRACK PANS, ETC.



ALTITUDE CONTROL VALVE—Available with electrical attachment to permit emergency closing from remote control station.



COLD WATER FLOAT VALVE—designed for either open or closed tank service and available in angle or globe body pattern with integral or remote pilot control.

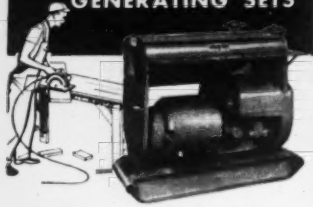
The patented air and water cushioning in all Golden-Anderson valves assures smooth operation and long life.

Our descriptive bulletins will interest you.

GOLDEN ANDERSON Valve Specialty Company

2094 KEENAN BUILDING, PITTSBURGH 22, PA.

FOR POWER BEYOND HIGH LINES
FAIRBANKS-MORSE
GENERATING SETS

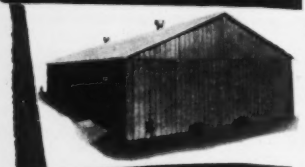


If you have a problem in power supply for a construction job; lighting an airfield or boat landing; power and light for a tourist court, summer camp or restaurant; lighting and heating country schools or churches; or for any other similar purpose, get the facts about dependable Fairbanks-Morse Generating Sets.

They are available in capacities from 600 to 35,000 watts, A.C. or D.C., and equipped with manual, remote or automatic starting devices. For details, see the Fairbanks-Morse dealer nearest you, or write Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE,
a name worth remembering

MESKER
PREFABRICATED
SECTIONAL-TYPE
STEEL BUILDINGS



Still Available

IN SPITE of the present acute steel shortage we may still be in a position to supply you a Prefabricated Steel Building with reasonable promptness. Write us your requirements.

GEO. L. MESKER STEEL CORP.
Fabricators — Evansville, Indiana — Engineers

MEN AND JOBS

EDUCATIONAL CONFERENCE—Officers of the American Society for Engineering Education, in conference at the 1951 convention at Michigan State College, are, left to right front: Henry H. Armsby, associate chief of engineering, U. S. Office of Education, vice-president; Dean F. E. Torman, Stanford University, vice-president; and Dean S. C. Hollister, Cornell University, president-elect; and back, Dean F. M. Dawson, State University of Iowa, president; and Gerald A. Rosselot, Georgia Institute of Technology, vice-president.

New Appointments

Highway department

Changes in Illinois highways division: **Wm. D. MacLeod,** to be district engineer at Carbonade; **D. S. Magowan** to the bureau of local roads and streets; **W. A. McCree** in charge of employe training and assignment.

State, City and County

Clarence W. Klassen, chief sanitary engineer of the Illinois Department of Public Health and technical secretary of the state Sanitary Water Board has taken office as chairman of the Ohio River Valley Water Sanitation Commission.

Clyde W. Coryell is the new commissioner of the Los Angeles Board of Public Works, succeeding the late J. O. Donovan.

J. M. Jarrett of Raleigh is chairman of North Carolina's new Stream Sanitation Committee. W. H. Riley is acting executive secretary.

James C. Alban, member of the Board of Directors of the American Road Builders Association and the Maryland Association of Engineers, has been appointed Maryland State Planning Commission and named chairman of that body.

Edwin M. Baylard has been appointed county superintendent of highways for Onondaga County, N. Y., to succeed Raymond B. Traver, retiring.

John R. Birch, formerly a consulting engineer at Elkhorn, Wisc., has been named director of public works and city engineer, Whitewater, Wisc.

Carmen Facciolo, Wilmington, Del., has been named to a three year term on the Delaware Board of Registration for Professional Engineers and Land Surveyors. He succeeds Thomas J. McDonnell, also of Wilmington.

W. G. Brown, city chemist, Durham, N. C., has been named assistant superintendent of the Water and Sewer Department for purification.

James Carswell of Wilmington, Del., has been appointed a member of the Wilmington, Del., Board of Water Commissioners by Mayor James F. Hearn to succeed Charles P. Maroney.

J. Guy Rollins, parish-city engineer of Baton Rouge, La., has been named Public Works Director of Dallas, Tex. following J. T. Conroy who has resigned. Rollins has twice before held this position, and has been city manager of Tyler, Tex.

E. C. Gunter, assistant planning director, city of Durham, N. C., has been named city planning director following the resignation of Frank Dieter who has become city planning engineer at White Plains, N. Y.

Max Holland, resident engineer for B. V. Van Ort Co. at Charlotte, N. C. has become assistant city engineer, Camden, S. C. succeeding L. H. Hardin who has resigned.

Lt. Col. Thomas J. Hayes, 3rd, and **Lt. Col. Carlin H. Whitesell,** have been promoted to colonel. They were Washington, D. C.'s two assistant engineer commissioners.

Charles G. Rummel, Chicago architect, has been named a member of the

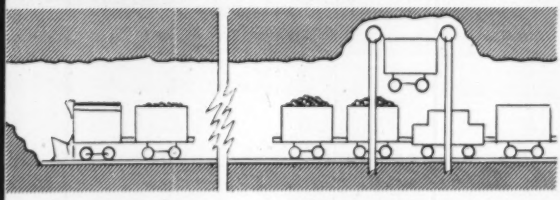
(*Continued on page 69*)

CASE HISTORY OF A SUCCESSFUL TUNNEL JOB

FROM THE EIMCO FILE T101

LEADVILLE DRAINAGE TUNNEL

Proposed tunnel length, 17,300; Length completed at end of war, 6,600; Tunnel size, 9' x 10'6"; Supported section, 64% of length; Rock section, 36% of length.



"Cherry Picker" method of car switching was used in the Leadville Tunnel. The frame was erected to lift the empty above the train of loads moving out, then lowered to be moved to the face for loading.

Equipment used for rock loading on contract jobs must be well built, proved, heavy-duty equipment—capable of standing up to the most difficult—most unexpected operating conditions.

Tunnels are carefully surveyed before they are started. Test holes are drilled from the surface at selected spots along the tunnel line to determine the ground structure through which the tunnel is to be driven, but even then, as in the Leadville Drainage tunnel, there are unseen glacial channels and faults which make progress slow and dangerous.

Loading in the Leadville Tunnel was done with Eimco Model 21 RockerShovels. These machines were subjected to the most severe operating conditions working in water at 37° temperature with an average flow of 3000 to 7000 gallons per minute.

EIMCO

THE EIMCO CORPORATION

The World's Largest Manufacturers of Underground Rock Loading Machines

EXECUTIVE OFFICES AND FACTORIES – SALT LAKE CITY 10, UTAH, U. S. A.

BRANCH SALES AND SERVICE OFFICES:

NEW YORK 51 52 SOUTH STREET • CHICAGO 3319 SOUTH WALLACE STREET
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IN FRANCE SOCIETE EIMCO PARIS, FRANCE
IN ENGLAND EIMCO (GREAT BRITAIN) LTD. LEEDS 12, ENGLAND
AGENTS IN ALL PRINCIPAL CITIES THROUGHOUT THE WORLD

240

You can't beat an Eimco!

Low costs and no complaints on this midtown excavation-and-tunnel with **ROCKMASTER** blasting!

Excavation under way for new Cain-Sloan Co. department store at Nashville, Tenn. Oman Construction Co., contractors; Marr & Holman, architects.

Final stages of excavation. Entrance to utility tunnel in right hand corner.

Inside utility tunnel.

THE job called for blasting 35,000 cubic yards of solid rock in the heart of downtown Nashville, Tenn. Ordinary blasting methods would have required pecking away at the rock with small amounts of powder in a few holes at a time.

But the contractor used ROCKMASTER to speed the job! Result: More powder could be loaded into more holes for each shot—more rock was broken with each blast. Breakage was excellent. Valuable time and labor were saved in moving and placing protective mats. Normal traffic flow was maintained at all times; and there were no complaints about noise or vibration.

ROCKMASTER "16" may be the answer to *your* blasting problems—in the heart of town or 'way out in the open. Write for your free copy of the ROCKMASTER "16" booklet that shows how you can profit through the use of the correct numbers of the *sixteen* ROCKMASTER milli-second delay electric blasting caps teamed with the ROCKMASTER system of explosive choice and loading methods. Our technicians will be glad to assist you in applying ROCKMASTER "16" to your operations.

ROCKMASTER: Reg. U.S. Pat. Off.

ATLAS EXPLOSIVES

"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

Men and Jobs . . .

Illinois architects' examining committee by the Illinois state director of education.

W. P. Tatum of Lumberton, Miss., was named engineer of state buildings to succeed the late J. Laird.

Elmer H. Talbert has been appointed Delaware Drainage Engineer, a new post created under the state's drainage law as of June 1 this year. He has served as conservation engineer in Maryland, Delaware, Pennsylvania and New York.

Government agencies

Edwin E. Brabetz is assistant chief, heavy equipment branch, Maintenance Div. of Military Supply and Procurement, office of Chief of Engineers, Washington, D. C.

Frank B. Campbell has been transferred by the Corps of Engineers from the Omaha, Neb., district to be chief of a new organization at the Waterways Experiment Station, Vicksburg, Miss., to be known as the Hydraulic Analysis Branch.

Business Changes

C. L. Vaughan Jr., of Shelby, N. C., and **Robert Ormon Ormand** of Bessemer City, N. C., have formed Ormand and Vaughan, Inc., of Shelby, a general engineering and architectural firm.

John W. Metcalfe formerly for 25 years with Bethlehem Steel Co. and more recently with Keystone Fabricating Co., has formed John W. Metcalfe Co., engineering drafting, structural steel derail drawings, at Bessemer Building, Pittsburgh, Pa.

(Continued on page 70)

Donald C. Peters has been elected president of the Mellon-Stuart Co., contracting engineers, Pittsburgh, Pa. He is a C.E. graduate of Marquette University. He was one of the 5-man general committee to rewrite the building code of Pittsburgh, and since 1948 one of the three members of the Board of Standards and Appeals, Bureau of Building Inspection.

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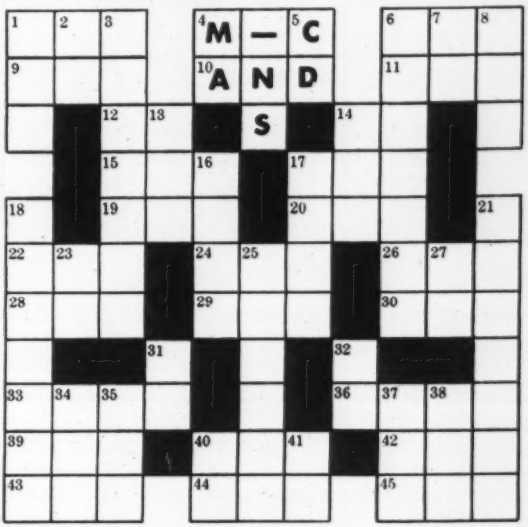

HORIZONTAL

1. Baseball Term
4. Master of Ceremonies (hyphenated)
6. Frenzied condition
9. Anthropoid
10. Conjunction
11. Royal Naval Academy (abbr.)
12. Before noon
14. Pronoun
15. Eccentric gear
17. Civil War General
19. Garden tool
20. Finish
22. Anger
24. National Recovery Act (abbr.)
26. Carnivorous bird
28. Grand Army of the Republic (abbr.)
29. Pickpocket (colloq.)
30. Came together
33. Weekly Magazine
36. Urge
39. Compass point
40. Insect
42. Goddess of Mischief (Gr. myth)
43. Moved swiftly
44. Total
45. To spread grain

VERTICAL

1. Grain
2. Opposite of down
3. Pedagogue
4. Advanced College Degree
5. Civil Defense (abbr.)
6. Liberty
7. Preposition
8. Color
13. Red Boss
14. Domestic Fowl
16. To fix
17. Jump
18. More constricted
21. Changed
23. Egyptian Sun God
25. Tore
27. Pronoun (plural)
31. Engineer
32. Bone
34. Girl's first name
35. Males
37. Small molded mass
38. Indian tribe
40. College Degree
41. Suffix

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For solution, see page 100

An Important Message on CMP

It has come to our attention that some steel consumers, particularly those concerned with "B" products, have been requesting allotments from their steel suppliers or passing on to them their allotment authorizations. This is contrary to CMP regulations, and seriously delays the entire allotment procedure for you.

Therefore, in an effort to help clarify this situation, we have briefly indicated below the general procedure which should be followed in securing an allotment.

▶ We would like to emphasize that steel warehouse distributors are not involved with the handling or issuance of allotments. When placing an order with your steel supplier, simply show your allotment number and the quarter for which the allotment is valid (Example: K-2-4Q51). Orders must also be properly certified under CMP regulations.

The General Requirements For Obtaining An Allotment

CLASS "A" PRODUCERS

1. If you are a producer of a class "A" product, you will get your allotments for controlled materials from the claimant agency (governmental), prime consumer (seller to claimant agency), or secondary consumer (seller to prime consumer) to whom you sell your product. IN EACH CASE, GO DIRECTLY TO YOUR OWN CUSTOMER FOR AN ALLOTMENT.

2. Your allotment application (Form CMP-4A) must include the amounts of controlled materials needed by your sub-contractors as well as by you.

3. You need not apply for controlled materials used for class "B" products to be incorporated in your class "A" product, since producers of class "B" products will receive their allotments direct from the NPA.

CLASS "B" PRODUCERS

1. If you are a producer of a class "B" product your application for controlled materials on Form CMP-4B must be sent to the proper industry division of NPA. You cannot obtain an allotment from any other source.

2. Your application Form CMP-4B must show all the controlled materials you need, as well as controlled materials needed by your sub-contractors producing class "A" products to be incorporated in your class "B" product.

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USS

UNITED STATES STEEL

Industrial and commercial

W. K. McGregor, Jr. has joined Aro, Inc., the contractor operators of the Arnoll Engineering Development Center, Tullahoma, Tenn., as an engineer.

Leonard E. Bates, maintenance of way engineer for the Atlantic Coast Railroad at Jacksonville, Fla. has been appointed assistant to the chief engineer of the railroad with headquarters at Wilmington, N. C.

John E. Kallgren, chief engineer of the Sieberling Rubber Co., Akron, has been named plant manager in charge of production and engineering, all plants, USA.

Paul W. Taylor, Jr., Wilmington, Del., was appointed field project manager for construction of du Pont's company office building near Newark, Del., Previously Mr. Taylor has been project manager on construction work at the Philadelphia, Pa., plant.

Edwin P. Schrank has been named chief staff engineer for Sieberling Rubber Co., Akron, responsible for design engineering and new and special engineering projects.

Consulting engineers

Announcement has been made of the promotion of **Stanley G. Langefels** to assistant to the president and appointment of **Albert Kennerly** to succeed him as director of field engineering for A. M. Kinney, Inc., consulting engineers and architects, 2905 Vernon Place, Cincinnati, Ohio.

(*Continued on page 73*)

SUPERVISING ENGINEER – Roy V. Lund is now supervising engineer of the physical plant of the University of Minnesota, succeeding Prof. N. F. Holman, retired. Lund began working in the department in 1922, while he was a student in the college of engineering.

MANITOWOC *is dynamite on any job!*

250 tons of slag per hour is what this husky Manitowoc 2½ yard is slugging out at the Duquesne Slag Products Co., in one of the toughest pits ever encountered. No drilling and blasting — just sheer shovel power does the trick.

This same tremendous power will pay off for you too — make your toughest jobs profitable — give you a decided edge on any bid. That's why experienced earthmovers are swinging over to Manitowocs — their rugged strength stands up for years — their simplicity of design and construction means less "down time" — their fast operating cycles produce more yardage, *and* the Torque Converter Drive, an extra bonus no other shovel offers, makes Manitowoc years ahead in design and yards ahead in performance.

Before you buy any excavator, get complete details from Manitowoc Engineering Works, 110 16th St., Manitowoc, Wis.

SEND FOR completely descriptive literature on the Manitowoc line. Built in 1-yd. 1¼-yd., 1¾-yd., 2-yd., 2½-yd., 4-yd., 5-yd., 5½-yd. shovel, crane and dragline sizes.

the Torque Converter makes the difference

Amazing power because load and engine power are automatically balanced. Actually multiplies torque at low speeds to give you tremendous lugging power for tough going. Provides an infinite number of speeds automatically without shifting. Cushions all shocks and jars, saves wear and tear on entire machine.

It's the greatest development in shovel history — and available only in a Manitowoc.

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TORQUE CONVERTER

SpeeCrane

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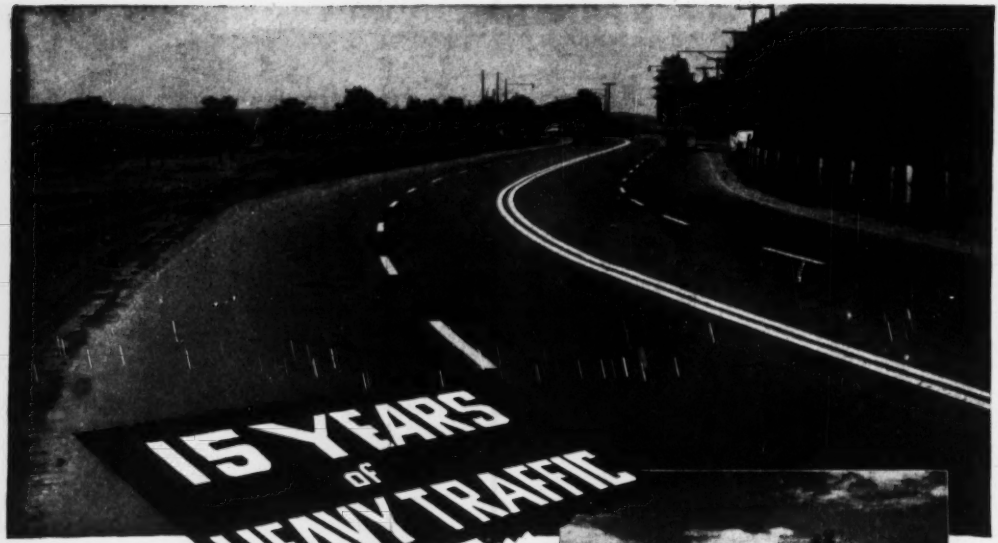

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THE best testimonial to Adnun design is the excellent condition of the miles of Adnun laid roads that have carried 15 to 16 years of heavy traffic. The oldest machine laid roads in the world are Adnun Roads. Look at the heavily traveled highway above—a part of the Hamilton-Brantford road in Ontario, one of Canada's main arteries—laid in 1936. The one below—Colorado Blvd.—one of Denver's well known streets laid in 1935. And the bottom picture—part of the Indianapolis Speedway laid in 1936.

These are but a few of many photographs in our files that show prominent traffic arteries in city, state and county systems. These are roadways that bear heavy traffic counts: Streets that take the beating of trucking and speed under a full range of weather conditions. Note the eveness of wear *clear across*, the few signs of patching, the freedom from breakdown.

The Adnun principle of continuous Course Correction assures surface smoothness and a uniformity of course thickness that no other paver can equal. The Oscillating Cutter Bar action cuts the material off at the proper level and does not tear it. Material is carried up to the parallel course and is compacted in place, making a tight joint, a joint that will not throw a car off its course. *The Adnun builds longer life roads and safer roads.*

You will be interested in the booklet, "11 Basic Things." It will give you some new thinking on black top paving equipment. Send for it.

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BANQUET SPEAKER—ASCE President Gail Hathaway addressed the banquet at the annual conference of the California Sections of American Society of ASCE held recently in Yosemite National Park, California.

DAVID FORGAN, left and E. J. Coleman, right are talking about $150,000,000 worth of construction. That's what construction for the Niagara Falls-Sir Adam Beck No. 2 generating plant will cost. Photographed at the Hydro-Electric Power Commission of Ontario's Niagara Falls field office. Mr. Forgan is director of construction for the commission, and Mr. Coleman is superintendent on the project's canal and forebay.

DAM AND LOCKS—Supervising first-stage construction on the dam and locks in the Mississippi River at Minneapolis are: E. Silverman, project engineer, Corps of Engineers, St. Paul District (at left); and H. L. Mundy, Jr., project engineer, Johnson-Kiewit, contractors on the work.

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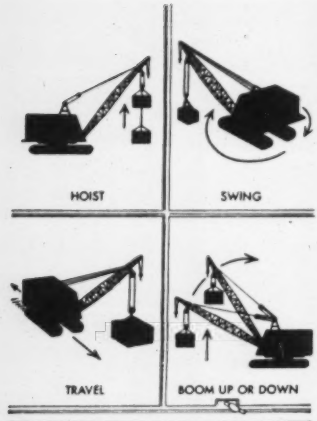

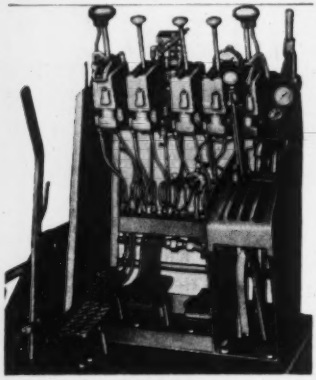

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EDUCATION, RESEARCH

Langlie names council for highway research

Created by the recent state legislature, a Washington State Council of Highway Research has been appointed by Gov. Arthur B. Langlie.

Members will include Prof. R. G. Hennes of the University of Washington civil engineering department; Prof. Emmett Moore, head of the department of civil engineering, Washington State College; Richard Watts, executive secretary of the Washington Association of County Commissioners; C. W. Martin, representative of the Association of Washington cities, and a representative of the state highway commission (yet to be named). W. A. Bugge, state highway director, is an ex-officio member.

"The council will consider for assignment to any appropriate agency any problem presented to it by the legislature, highway user groups or any other representative body which has problems in the field of highways, roads and streets," said Mr. Bugge.

Engineer substitutes ozone for chlorine

A University of Washington research group under the leadership of Richard G. Tyler, professor of sanitary engineering, is experimenting with the substitution of ozone for chlorine as a bleaching agent in the production of wood pulp.

It is believed ozone bleaching might eliminate the eventual discoloration of newsprint which now occurs where chlorine has been used.

The group also has been experimenting in treating cyanide and other industrial wastes with ozone, rather than with chlorine. The Boeing Airplane Co. of Seattle is considering establishment of a pilot ozone plant for treatment of its cyanide wastes.

Ozone treatment also is proposed in a new waterworks planned at Fairbanks, Alaska.

Brief news of education and research

• **Miniature Niagara**—Water will soon start pouring over a miniature of Niagara Falls constructed at the Waterways Experiment Station of the Corps of Engineers at Vicksburg, Miss., the Department of the Army has announced. Maj. Gen. Lewis A. Pick, Army Chief of Engineers, says that the model, which reproduces features of a 2¾-mile area of the Niagara River both above and below the falls, will be used to study hydraulic characteristics of the river.

• **Plastic tubes for radiant heating**—An experiment with plastic tubing for radiant floor heating is being conducted by the Bjorksten Research Laboratories, Inc., in Madison, Wis. Three types of plastic tubing for floor heating have been installed to determine the practicability of plastics. The three kinds of plastic tubing used are vinylidene chloride, a vinyl chloride co-polymer, and polyethylene, each in its sector of the floor. The plastic tubing has a ½-in. inner dia., cast in the concrete floor, with 2 in. of concrete above it. The plastic tubing is coiled, with 6-in. distance between parallel lengths of tubing. Heating is by circulating warm water and at no time during the past winter was it necessary to raise the water temperature above 135 F. Johan Bjorksten reports the system appears entirely satisfactory. Advantages of plastics are said to be complete freedom from corrosion, and lower initial and installation costs than metals.

• **First 5-year class**—A milestone of engineering education was reached in June with the graduation of the initial 5-year engineering class at Cornell University. The program was set up in 1947 to give young engineers a broader preparation for meeting new responsibilities in society. One hundred and fifty students, representing six engineering fields, make up the first class to complete the course. Dean S. C. Hollister says that experience with the "pilot" group has convinced the university of the soundness of the program.

• **Controlling soil erosion**—Chemicals which show promise as agents for controlling soil erosion are undergoing test at Ohio State University. Research began last December at the university's engineering experiment station to determine effectiveness of the chemicals in "anchoring" soil samples taken from various parts of the country and subjected to erosive action of artificial rain.

• **Rubber research**—Joseph H. Rowe, specialist in asphaltic concrete research, has joined the Natural Rubber Bureau research laboratory to concentrate on rubber road development work and general asphalt experiments.

(*Continued on page 77*)

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Clow CAST IRON PIPE (THREADED) used again!

Artist's conception of beautiful new Florsheim Building recently erected in Chicago.

34 Tons of Clow (threaded) CAST IRON PIPE Used in Construction of Modern Building

Once again, Clow Cast Iron Pipe has been chosen for all 3-inch and larger downspout, waste and vent piping because of its lasting, non-corrosive qualities. In this up-to-date building 34 tons—nearly 5,000 feet—of Clow Pipe was cut, fitted and installed for these services.

Here's why the Architects specified (threaded) Cast Iron Pipe:

Shaw Metz and Dolio, the Architectural firm, specified cast iron pipe because it gives long life service and has the corrosion-proof qualities so important in an all-modern building such as this.

Result: the costly replacement of worn out installations is avoided—because it's an accepted fact that Clow Cast Iron Pipe has a useful service life of more than a century.

Clow Cast Iron Pipe originally was specified for this new building by the Architects. When the owners considered using a comparatively less expensive type of piping, they were assured that such a substitution would be a false economy—due to the far greater life expectancy of the Clow Pipe.

ARCHITECTS:
Shaw Metz & Dolio
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Clow (threaded) Cast Iron Pipe has same O. D. as wrought pipe, is available with plain or threaded ends, in 3, 4, 5, 6, 8 and 10" sizes in 18' random lengths. Also available with integral calking hub on one end (other end plain) in 18' random lengths in 4, 6 and 8" sizes.

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on the job, with ordinary tools of the piping trade.

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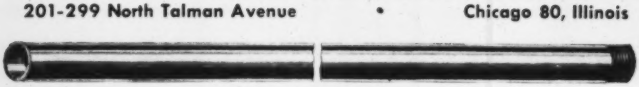


and their National Cast Iron Pipe Division, Birmingham, Alabama; subsidiaries
Eddy Valve Co., Waterford, New York;
Iowa Valve Co., Oskaloosa, Iowa.

Education, research . . .

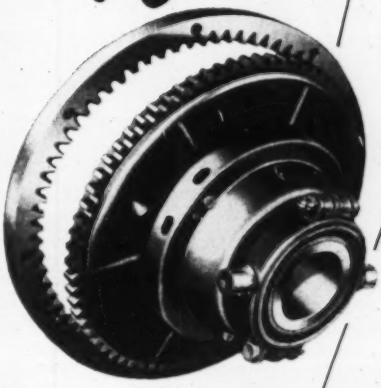
DRY DOCK WIND RESISTANCE—Prof. Socrates de los Santos, Department of Aeronautical Engineering, New York University College of Engineering, adjusts a small scale model of a floating drydock in the wind tunnel in connection with a research project for Frederic R. Harris Co., New York City, which is designing a full-size drydock of the same kind for the U. S. Navy. The floor represents the ocean and tests are being made to determine gale forces on such a drydock which may be anchored at sea. The full size drydock will accommodate ocean-going ships and will be built in sections.

Closet-walls—Interior partitions which include provisions for storage are to be studied by the Small Homes Council of the University of Illinois under a $4,650 grant of the Lumber Dealers Research Council. The purpose is to prepare recommendations for construction of closet-walls which can be adopted to any house—new or old. They will be modular in dimension (divisible by 4 in. or multiples), and will be flexible in construction and materials. This investigation will help to utilize fully the benefits of cost-saving roof-truss construction methods. These take the structural load off partitions, making possible light-weight construction of interior walls. Truss construction also allows closets and storge areas to be built by new cost-saving techniques.

• **Aerial soil surveys**—Soil parent materials can be differentiated on the basis of changes in land form, drainage pattern, gully shapes, photographic gray tones and vegetation. Engineering characteristics of the soils are predicted from an existing soil key. Typical soil profiles are used to give a three-dimensional picture of soil areas. This method of airphoto interpretation is applicable to preliminary engineering soil surveys.—Robert D. Miles, research assistant, Joint Highway Research Project, Purdue University, Lafayette, Ind.

(*Continued on page 79*)

always the right connection between driving and driven units . . .



Wherever you find horsepower at work, you will find Twin Disc Clutches and Hydraulic Drives.

That's because Twin Disc offers *standard* units for every kind of application in the industrial field, from split-second work cycle operations to 1000 hp tugs-of-war between prime movers and mother nature.

Thirty-three years of working with hundreds of leading equipment manufacturers have proved that, no matter the problem, Twin Disc can help provide the answer.

And an answer that is impartial, for not only does Twin Disc offer a complete line of friction clutches, it offers a complete line of industrial fluid drives as well.

That's why for the *right connection between driving and driven units*, always specify Twin Disc.

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Twin Disc's Model CL Clutch is a compact husky, known wherever construction equipment is used. Three Model CL Clutches are employed in this Cedar Rapids "Rock-It" plant, operating under severest conditions. Model CL Clutches are offered in one, two and three-plate construction in 5½ to 11½ inch models. Ample safety factors insure long trouble-free wear life. Single point adjustment is made from the outside of the clutch without the use of any tools.

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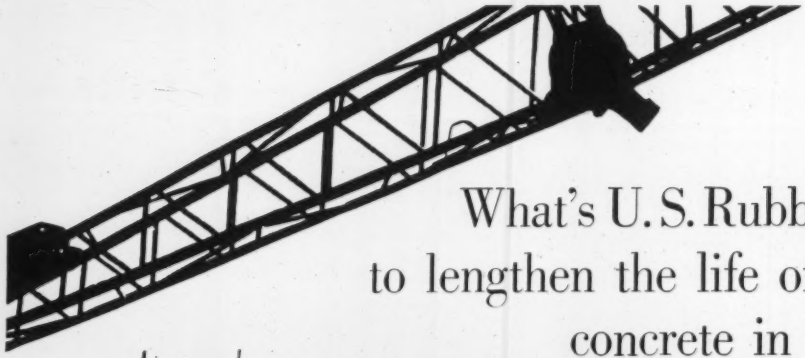


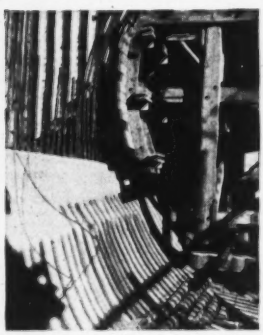
What's U.S. Rubber doing to lengthen the life of concrete in tunnels?

Tunnel section of the San Angelo Dam, San Angelo, Texas. The concrete was cast against Hydron Form Linings which provide a smooth, pit-free surface, enabling the concrete to withstand the grinding action of high-velocity, silt-laden water.

Curved concrete in tunnels can be made several times more resistant to abrasion and freeze-thaw by being cast against U.S. Rubber's Hydron Form Linings.

Hydron absorbs excess water and eliminates trapped air from the surface. The case-hardening effect is gradual from the surface into the mass for about an inch. The linings are mounted on wood forms with rapid-fire staple guns, and on steel forms with a special adhesive. Furnished in flexible sheets, Hydron can easily be cut or trimmed.

Among the big installations on which Hydron was used are: Whitney Dam, Bull Shoals dam, Memphis floodwall, Delaware & Chesapeake Canal and bridge abutments. For more facts write to address below.



Using a curved, hinged form on the upper 300° with Hydron Form Linings. Hydron can also be used on the lower 60°. After floating the concrete, apply Hydron and weigh down with 2 inches of sand.

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Education, research . . .

Many young engineers are getting good jobs

Employment agents of 176 large industries spent considerable time at Rensselaer Polytechnic Institute during the last few weeks of the spring semester, seeking engineers from the 1951 class. One senior was offered 14 jobs, 10 were offered 10 or more jobs, and practically every graduate who wanted to work got a place to suit him at a salary 16 percent and more above the average starting salary for an engineer completing his course in 1948.

Herbert P. Catlin, director of placement for the institute, says nearly 300 of the 850 June graduates have given him pay information. They average to get $529 more per year than the men who started out in their professions four years ago. Most in demand were capable men in research, development, design and planning. These fields accounted for more than twice the demand for men in production, maintenance, sales and other engineering activities.

Fellowships and scholarships offered

Fellowships and scholarships for study in Yale University's Bureau of Highway Traffic for the academic year 1951-52 have been awarded to 15 graduate engineers from 12 different states. The 11 fellowships provide stipends of $1400 each and enable the recipients to engage in a full academic year of graduate study and research in traffic engineering. Winners for 1951 of the 10 scholarships in civil engineering awarded by the American Institute of Steel Construction have just been announced. The ten winners were selected from a group of 52 high school seniors nominated by steel fabricating companies.

Two MIT scholarships given by H. A. Kuljian

To help engineers meet human relations problems often encountered in their work, particularly in foreign countries, Harry A. Kuljian, Philadelphia engineer and head of the firm bearing his name, has established two scholarships in the humanities for seniors at the Massachusetts Institute of Technology, of which Mr. Kuljian is a graduate.

These scholarships, valued at $500 each, are intended to help promising engineering students to round out their educations through gaining a better understanding of human relations in applying technical training.

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4 days' work in 3

35% more footage with 3 heavy rock drills

because, with 365 instead of 315 ft. of air, you hold full pressure instead of 70 lbs. in the tools.

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JAEGER "Air-Plus" COMPRESSORS

deliver 15% to 25% more 100 lb. air at lowest cost per cubic foot of any compressors on the market, to run tools at their full efficiency.

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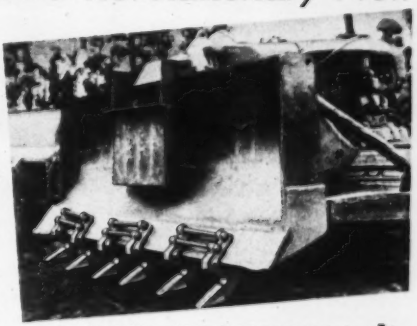

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MEETINGS

Information from eight states signatory to the Ohio River Valley Sanitation Commission pact, which met recently in Cincinnati for the commission's third annual meeting, indicated that 39% of the wastes from the 8,500,000 people in the valley is getting some form of treatment and that new plants now under construction will serve another 8%. According to Clarence W. Klassen, new commission chairman, "Whether or not the rate of new construction can be maintained depends in some measure on the ability to get materials and to float bond issues. Final plans have been completed and approved for plants to serve 20% of the population in the valley and another 17% has final plans in preparation."

The Acoustical Materials Association has re-elected its president, Charles J. Nocar of the E. F. Hauserman Co., Cleveland, Ohio. George W. Handy of the National Gypsum Company, Buffalo, N. Y. was re-elected vice-president, and 14 members were elected to the Board of Directors.

Laurence L. Dresser, president, Dresser Engineering Co., Tulsa, Okla., has been elected president of the National Society of Professional Engineers, succeeding S. L. Stolte, of the St. Paul architectural firm of Bettenburg, Townsend & Stolte. Newly elected vice presidents are: Chester Lichtenberg, Fort Wayne, Ind.; J. F. Reynolds, Jacksonville, Fla.; T. C. Forrest, Jr., Dallas; and D. C. Griffen, Seattle, Wash.; R. B. Allen, College Park, Md., was reelected treasurer, and Paul H. Robbins, reelected executive director and secretary.

CALENDAR

Canadian section, American Sewage and Sanitation Equipment Association, Royal York Hotel, Toronto, Ont., Aug. 20-22.

National technical conference of the Illuminating Engineering Society, Hotel Shoreham, Washington, D. C., Aug. 27-30.

N. J. Society of Professional Engineers, Manasquan River Golf Club, Brielle, N. J., Sept. 8.

New England Water Works Association, Hotel Statler, Boston, Mass., Sept. 10-12.

Minnesota section, American Water Works Association, fall meeting, Hotel Nicollet, Minneapolis, Sept. 12-14.

N. Y. section American Water Works Association, fall meeting, Whiteface Inn, Lake Placid, N. Y., Sept. 13-14.

Public Works Congress and Equipment Show, Memorial Bldg., Detroit, Mich. Sept. 16-19.

Pennsylvania section, American Water Works Association, Bellevue-Stratford Hotel, Philadelphia, Pa., Sept. 19-21.

S. D. Water and Sewage Works Conference, Chas. Gurney Hotel, Yankton, Sept. 19-21.

Kentucky-Tennessee section, American Water Works Association, fall meeting, Louisville Kentucky Hotel, Louisville, Ky., Sept. 17-19.

Michigan section, American Water Works Association, fall meeting, Whitcomb Hotel, St. Joseph, Sept. 19-21.

Rocky Mountain section, American Water Works Association, fall meeting, Hotel Cosmopolitan, Denver, Colo., Sept. 24-25.

9th International Road Congress, Permanent International Association of Road Congresses, Lisbon, Portugal, Sept. 24-29.

Alabama-Mississippi section, American Water Works Association, Buena Vista Hotel, Biloxi, Miss., Sept. 24-26.

Wisconsin section, American Water Works Association, fall meeting, Pfister Hotel, Milwaukee, Sept. 25-27.

Ohio section, American Water Works Association, fall meeting, Commodore Perry Hotel, Toledo, Ohio, Sept. 27-28.

Missouri section, American Water Works Association, Hotel Robidoux, St. Joseph, Mo., Sept. 30-Oct. 2.

First Pan American convention, International Road Federation, Municipal Palace, Lima, Peru, Oct. 5-6.

Federation of Sewage & Industrial Waste Association, Municipal Auditorium, St. Paul, Minn., Oct. 8-11.

National Safety Congress and Exposition, Stevens, Palmer House, Congress, Morrison and La Salle hotels, Chicago, Oct. 8-12.

Structural Engineers Association of California, The Akwahnee, Yosemite National Park, Calif., Oct. 11-13.

Engineers Council for Professional Development, Statler Hotel, Boston, Mass., Oct. 19-20.

National Council of State Boards of Engineering Examiners, Statler Hotel, Boston, Mass., Oct. 21-24.

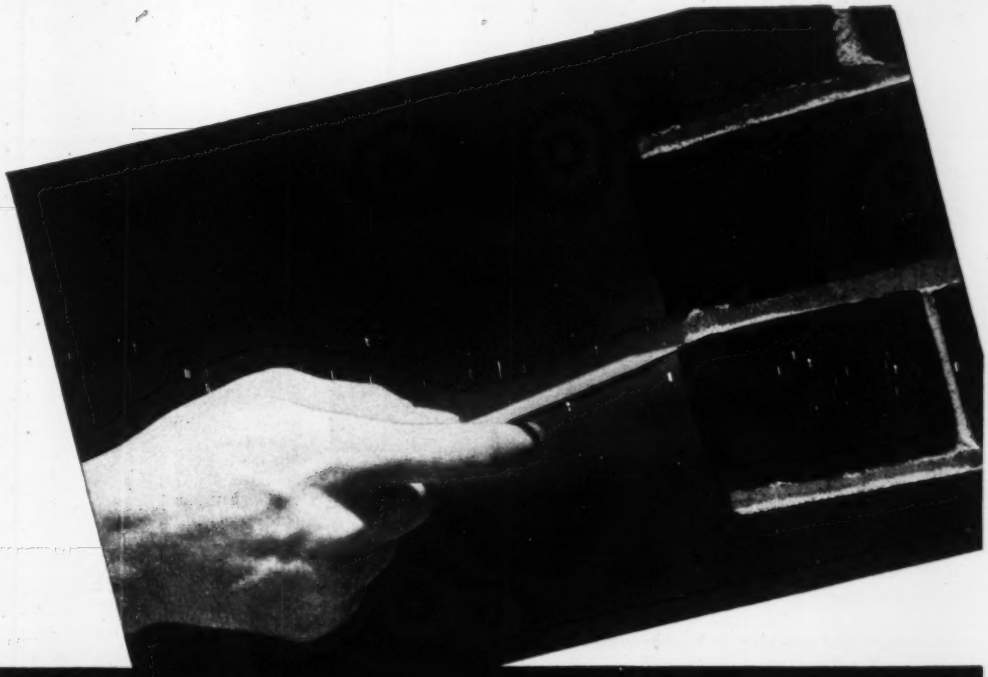
American Bridge, Tunnel and Turnpike Association, St. Francis Hotel, San Francisco, Oct. 21-24.

American Society of Civil Engineers, annual meeting, Statler Hotel, New York City, Oct. 22-25.

American Association of State Highway Officials, Fontinelle Hotel, Omaha, Neb., Oct. 23-26.

National Standardization Conference, Waldorf-Astoria Hotel, N. Y. City, Oct. 22-24.

California section, American Water Works Association, Fairmount Hotel, San Francisco, Oct. 23-26.



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FOREIGN

THE GREEKS HAVE A WORD FOR IT—It is "technical assistance" from the United Nations Commission for Economic Development. Here some of the previously idle manpower of Greece is working on this 10½-mile-long flood control ditch between Skafidhe and Koila in northern Greece. The finished sections of the project have already made 2,700 acres of land arable.—Eastern Pubs photo.

Movement is started for uniting European electrical installations

The organization for European Economic Cooperation with the ECA is about to launch a drive to unify the European power picture in an effort to remedy the continent's electric power shortage.

Keynote of the OEEC campaign is international cooperation by which the organization hopes to boost Western European effective power output by 7 or 8% in two years.

The drive for power will be three-pronged:

A. It will see maximum interconnection between national power systems across national frontiers. Inside national bounds it will strive to increase the efficiency of local interconnections.

B. Trade experts will seek to develop a system of financing international power exchanges within the framework of OEEC's European payments union.

C. OEEC is drawing up a program to expand output of existing hydroelectric plants by adding new equipment.

Behind the interconnection concept is an attempt to make it possible for neighboring power systems to share each others' surplus power output in spite of international boundaries. This can result in considerable savings where peak loads come at different times. Hydroelectric producers would have less incentive to spill water, with a net increase of electric power (and a saving of coal as far as the whole continent is concerned.)

OEEC's timetable calls for the creation of an international electricity authority to pool larger and larger sections of Western Europe's power industry. It is even hoped that this authority may be the embryo for eventual complete fusion of the various national industries.

OEEC estimates that it will take about a year and one-half from the time the Electricity Authority is set up to complete installation of additional hydroelectric generating machinery.

On this basis, the whole program would be finished in two years.

• **ECA reaction**—Some ECA officials believe the Electricity Authority is grandiose, expensive, and a thinly masked cartel which might actually prove ineffective. According to these thinkers, the real job of interconnection should be done at regional and company levels. Yet in spite of differences between the two agencies, there is solid agreement as to the ends to be achieved. All agree that Western Europe needs to go beyond purely national power investment programs. Meanwhile, investment capital to support the program seems to be in even shorter supply than electric power itself in Western Europe.

Measure of the shortage that lies ahead on the continent is the soaring of its peak load from 33.1 million kw in 1948 to 48.5 million kw in 1953. Unless total capacity of electric generated equipment increases from 1948, 29.3 million kw to 45.1 million kw in 1953 as planned by OEEC, a continental deficit at peak will not decrease but go beyond 1938's 3.8 million kw.

Foreign Briefs

• **Cuban bus terminal**—A new bus terminal on the airport highway, 20 minutes out from the heart of Havana, is doing a big business. It is estimated that 1800 buses and 24,000 passengers are using the terminal daily.

• **Hydro power on the Tiber**—In our report on plans for harnessing the Tiber River in Italy (ENR July 12, p 52) the head on turbines at the Castel Guibileo plant at time of low water should have been given as 3.5 meters, not 3.5 in.

• **Cape Town's budget**—The city of Cape Town, South Africa, has prepared a 5-year budget necessitating capital expenditure of 22 million pounds. Specially named projects are additional water supply, new municipal buildings, non-European housing, recreational resorts and modern swimming pools.

• **El Panama Hotel**—A credit of $1,500,000 to the government of the Republic of Panama has been authorized by the Export-Import Bank of Washington. The funds will be used to complete the financing of the ultra-modern, air-conditioned "El Panama" Hotel in Panama City.

• **Gibraltar water**—In search of a dependable means of purifying drinking water, the city of Gibraltar recently called upon Arrowhead and Puritas Waters Inc., Los Angeles, for data concerning its large-volume water distillation process. Gibraltar is situated upon the famous rock guarding the entrances to the Mediterranean. In all of the sieges of Gibraltar dating back to 711 A. D., water has been a critical issue. Water supply for drinkng and cooking is wholly rain water stored in great tanks, excavated deep in the rock. There are only two fresh water wells in use. The 12,000,000 gals. in storage come from specially prepared collecting areas covering some 50 acres, high on the rock. In a completely isolated position, the rock would have to provide water supply for greatly increased garrisons in case of another world war.

(*Continued on page 85*)

The PIONEER and still the LEADER!

JOY LIGHTWEIGHT WAGON DRILL

Introduced by JOY 8 years ago—hundreds in use, nation-wide . . .

HERE'S WHY:

- MORE HOLE PER SHIFT with the *exclusive* "drill and blow" feature.
- REALLY LIGHTWEIGHT—only 750 lbs.—less than half the weight of conventional wagon drills.
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SPECIAL SCRAPER ROPE

Lang Lay, with Independent Wire Rope Core
1/2" or 9/16"

On your scraper the *cable* has a lot to say about *control*—control of the cut, yardage per load, round trips per hour, cost per job. To follow through on these opportunities for fast, economical production, see that *Preformed* Yellow Strand Special Scraper Rope goes aboard each earthmoving machine.

The operator gets *accurate* response with this smooth-running cable. It's limbered to take short bends and sudden shocks . . . to spool evenly . . . to handle safely when the line is shifted. Special lubrication equips the rope for rugged wear and exposure.

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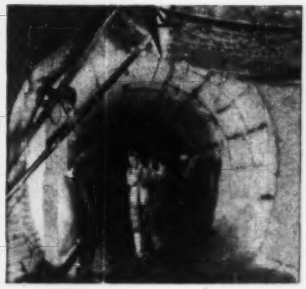

ALGERIAN POWER TUNNEL—Marshall Plan counterpart funds are helping to build the biggest hydroelectric power plant in French overseas territory—that on the Oued River in Algeria. The project comprises a 6-mi tunnel to carry water to a vast underground plant about 200 ft below the surface. When completed the project will supply power for one-quarter of the needs of the country. The picture shows men working inside the tunnel, now practically complete.

U. S. firm finishes Sumatra soil studies

The consulting firm of Dames & Moore has just completed a six-month soil investigation in the jungles of Sumatra, Indonesia, for California Texas Oil Company, Ltd.—in turn performing engineering and technical service for Caltex Pacific Petroleum.

Caltex engaged the soils firm to study subsurface conditions and advise on foundations to be designed for an entirely new oil development begun in 1949. (World War II kept Caltex Pacific from getting started sooner. The field was mapped, pre-war, but it then fell into Japanese hands. Some 20 wells are drilled.

• **What's to be built**—Facilities to be built include an oil field gathering and pumping station; 18 miles of pipeline from the field to a terminal at the Siak River (which flows eastward from the center of Sumatra to the Strait of Malacca); a pier, and two storage tanks 120 ft in diameter and 40 ft high at the river terminal where river tankers will load; and an ocean terminal 80 nautical miles downstream where river tankers will unload into 140,000-bbl storage tanks for transshipment into ocean-going tankers.

The coastal set up—where tanks 160 ft in diameter and 40 ft high, plus an 850-ft-long loading wharf must be built—is a critical one. How to found the tanks on a geologically recent and thick deposit of highly unstable marine-deposited clay is the problem.

(Continued on page 86)

WORLD'S BEST METHOD FOR PIPING

The Victaulic name stands for pioneering and world leadership in quick, dependable piping construction. Victaulic offers a *complete method* of piping that just can't be beat! From one end of the line to the other . . . for almost every kind of piping job . . . you'll find that Victaulic's the EASIEST WAY TO MAKE ENDS MEET!

Victaulic is *not* just a quick way to hook up pipe line sections . . . it's a COMPLETE METHOD with a versatile line of Couplings, Full-Flow Elbows, Tees, and other Fittings. Victaulic offers wide adaptability and makes joining those pipe ends quick, easy, and economical. A simple two-bolt coupling brings pipe ends together in a jiffy; a speed or T-wrench is the only tool required. AND the Victaulic Method assures positive-locked, leak-proof joints even under extreme pressure, vacuum, or strain conditions.

Preparing pipe ends is a cinch with the "Vic" Method . . . "Vic-Groover" grooves 'em automatically, twice as fast as a conventional pipe threader!

On *your* next piping job — new construction, repairs, or alterations — try the Victaulic Method and you'll save time, work, and money!

Make that next piping job ALL VICTAULIC! Write today for Victaulic Catalog and Engineering Manual No 44-ED

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PIPE COUPLINGS AND FITTINGS

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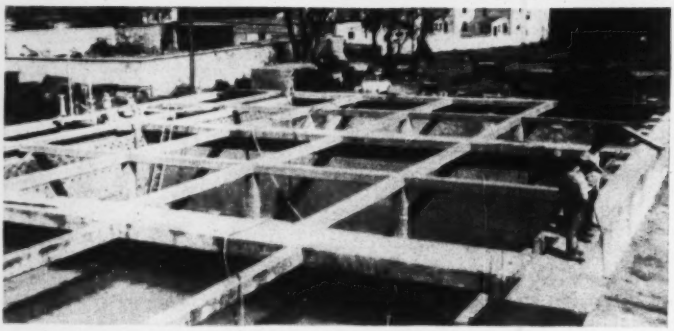

CEMENT GUN COMPANY RELINES SETTLING BASINS WITH GUNITE

Photograph above shows three of four Settling Basins at a Virginia City's Municipal Water Works during the course of being relined with "Gunite". The concrete in this structure had disintegrated considerably, due to chemical and frost action.

Cement Gun Company crews replaced a "Gunite" lining on the floor and on the exterior walls of the basins and, in addition, grouted under the floor of all four basins to solidify the structure.

Additional reinforcing of steel mesh and "Gunite" was added at all corners where failure was indicated by leakage and the presence of large cracks.

This is just one of many typical "Gunite" repair jobs which have been done. For information on "your job" and description of many other "Gunite" jobs, performed by us, send details and request catalog A-2400—on your letterhead, please.

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"GUNITE" CONTRACTORS
GENERAL OFFICES—ALLENTOWN, PENNA. U.S.A.
MANUFACTURERS OF THE CEMENT GUN

FOREIGN . . .

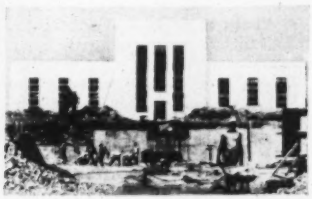
• **On what is it to be built?**—To build its first tanks in the area and to get oil flowing, Caltex has chosen to drive some 930 70-ft timber friction piles from Oregon under each. Even at $3 per ft delivered, the price of the costly imported piling beats the cost of producing scarce local iron-wood piles.

Cost per foundation will exceed $250,000, as much as the tank itself will cost erected.

Studies are being made in an effort to develop a method of supporting additional required tanks on some foundation less costly. Under consideration is a plan to extend tank walls downward into the soft earth to form an integral foundation ring that would prevent movement of soil out from underneath the tanks. Just how to erect such a tank in the field so that the extended walls could be made to settle evenly without tilting is one of the many construction problems to be solved.

Field explorations in Sumatra were directed by V. A. Smoots, resident partner in New York City for Dames & Moore. Soil samples sent from Sumatra to Dames & Moore in New York were analyzed under the direction of Gardner Reynolds. In Sumatra, Walter Miller, in charge of construction for Caltex, is now getting work started under contracts with California's International Bechtel, Inc.; The Gammon Company, of London and Singapore; and the Volkers Company, and Indonesian contractors.

Wharves for the river and ocean terminals are being designed by Knappen, Tippetts, Abbett Engineering Co., of New York; the oil handling facilities by J. O'Donnell, New York.



GOLD COAST PROJECT—Accra is the chief town of the Gold Coast, British crown colony and protectorate on the Gulf of Guinea, Africa. This new water filter house at Weija will make it possible to supply Accra with 6 mgd instead of 2 mgd as at present. Water will be pumped at night to a large tank 305 ft above sea level and will then flow through the treatment plant into a 1,000,000-gal reservoir and flow thence by a cast iron pipe of 16 in. dia and nearly 12 mi long to Accra.

My jobs moved along in the Toughest Weather

...thanks to Herman Nelson *Safe* Portable Heaters

"Remember last winter? My construction schedules were completely shot until I equipped with Herman Nelson heaters. From then on the jobs moved along even in the toughest weather. Believe me, I found the answer to winter slow-downs . . , and I'll be ready for this one coming up."

Another construction man has learned to lick *bad weather* job-lag with modern heating methods. Herman Nelson portable heaters supply Quick-Clean-Safe *heat* where you want it and when you need it . . . to keep construction rolling. These adaptable mobile units heat, dry, thaw and ventilate without expelling dangerous fumes, smoke and carbon monoxide into enclosed working areas. They're absolutely safe as well as efficient. The secret is Herman Nelson's unique "sealed flame" principle and forced-air ventilation found in *no other* portable heating device.

To add weeks of working weather to your winter construction schedule, let us show you why construction engineers and contractors are investing in Herman Nelson portable heaters. For full information write Dept. EN-8.

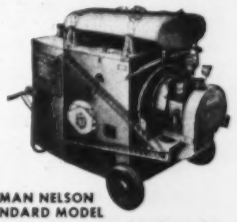
Today's Best Buy is Better Air!

HERMAN NELSON DE LUXE I

Capacity 280,000-450,000 BTU/hr • Completely automatic, including temperature control • Fresh air delivery 2,000-2,350 cfm • Electric motor powered.

HERMAN NELSON ECONOMY MODEL

Priced lower for smaller jobs • Capacity 125,000-190,000 BTU/hr • For 115/230 volt A.C. • Costs but 1½¢ per hour to operate.



HERMAN NELSON STANDARD MODEL

Capacity 250,000-385,000 BTU/hr • Gasoline engine powered • Completely self-contained • For areas lacking electricity.

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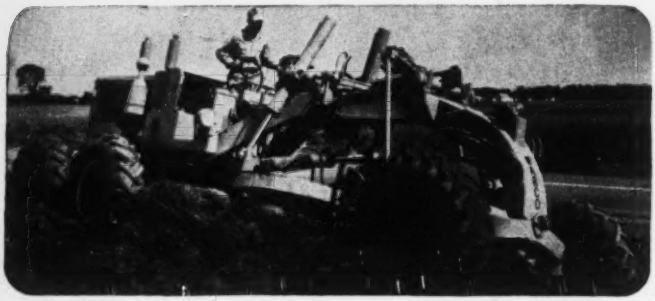
Division of **AMERICAN AIR FILTER COMPANY, INC.**

MOLINE, ILLINOIS

the WARCO motor grader has positive hydraulic controls... cab-controlled



blade positions... rugged long-life construction.

• Included in the base price are features usually billed as "extras" by other makes.

• For a unique combination of practical work-producing features, you pay the market's best price. Your WARCO dealer can prove this... ask him!

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Heavy Duty 100 H.P.
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OBITUARY

Charles R. Woodhull, 73, for 19 years city engineer of Newburgh, N. Y., and a veteran of 43 years service for that city, died there July 13. He was a 1901 graduate of Massachusetts Institute of Technology. In 1906 he went to Newburgh and formed a partnership with Wm. J. Blake. In 1946 he was president of Orange county chapter of the N. Y. State Society of Professional Engineers.

Joseph B. Barry, a New York State highway engineer, died July 19 in Syracuse.

William V. McShaffrey, 61, for the last three years head of the E. & W. McShaffrey Construction Co., Akron, Ohio, and former superintendent of the city street repair department there for 15 years, died July 23.

Robert P. Buettner, 31, Dayton, Ohio, engineer and architect, died in an automobile accident July 21. He was a graduate of the University of Cincinnati and of the University of Illinois.

Maj. F. A. Fetter, Jr., 47, of Washington, D. C., a graduate of the North Carolina State College School of Engineering, Raleigh, N. C., and recently personnel officer of the U. S. Department of Interior, died July 22. He was with the North Carolina Highway Department for several years after college. Subsequently, he was associated with the Bureau of Public Roads in Tennessee and Maryland.

David E. Wentzel, 74, a construction engineer of Arlington, Va., died July 19 while inspecting several wards under construction at Walter Reed Hospital. Employed by the United States Engineer Corps since 1941, Wentzel had formerly worked for the Arlington County sewer department and later the Public Housing Administration.

Charles A. W. Musson, 78, a civil engineer for the Milwaukee R. R. for 50 years, died July 19 at Seattle, Wash. He was assistant divisional manager until his retirement three years ago.

Dominic Fiorito, 67, paving contractor of Seattle, Wash., died there July 22. Born in Italy, he came to the United States in 1901, and formed his first paving-contracting company in 1912 with three brothers. He became a partner in the Northwest Contracting Co. in 1932, and four years ago formed

(*Continued on page 91*)

Are you turning in all your SCRAP?

Don't wait for "George" to do it

IF you are a steel user, this important job of getting more scrap back to the mills is directly up to *you*. You just cannot afford to sit idly by while the scrap shortage gets worse. For unless everyone really pitches into this job of digging out all the scrap possible, steel production is bound to suffer, and every steel user, in more or less degree, will suffer too.

More scrap means *more* steel—it's as simple as that.

Right now some mills have only a bare two-days' supply of scrap on hand. Others have even less. Some steel-making furnaces already have had to shut down for lack of scrap. The situation is serious. Only you can help improve it.

By turning in every piece of worn-out equipment, every obsolete tool and machine, in fact every pound of iron and steel scrap you can comb out of your plant, you'll be helping relieve the worst scrap shortage since Pearl Harbor days . . . and the steel industry will be able to produce more of the steel you need.

Remember—it takes at least one-half ton of scrap to make one ton of steel. To maintain steel's present high production schedules requires more than 1400 carloads of industrial scrap *every* day. So turn in your scrap—ALL your scrap—and keep the mills rolling. This is more than a shortage. It's an emergency that vitally concerns you—and us—and the Nation.

You'll find your local scrap dealers listed in the yellow pages of the phone directory.

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but, because without SCRAP we cannot produce steel, we are asking instead for your all-out help in getting more SCRAP to the mills.

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UNITED STATES STEEL

JENKINS PRACTICAL PIPING LAYOUTS 56

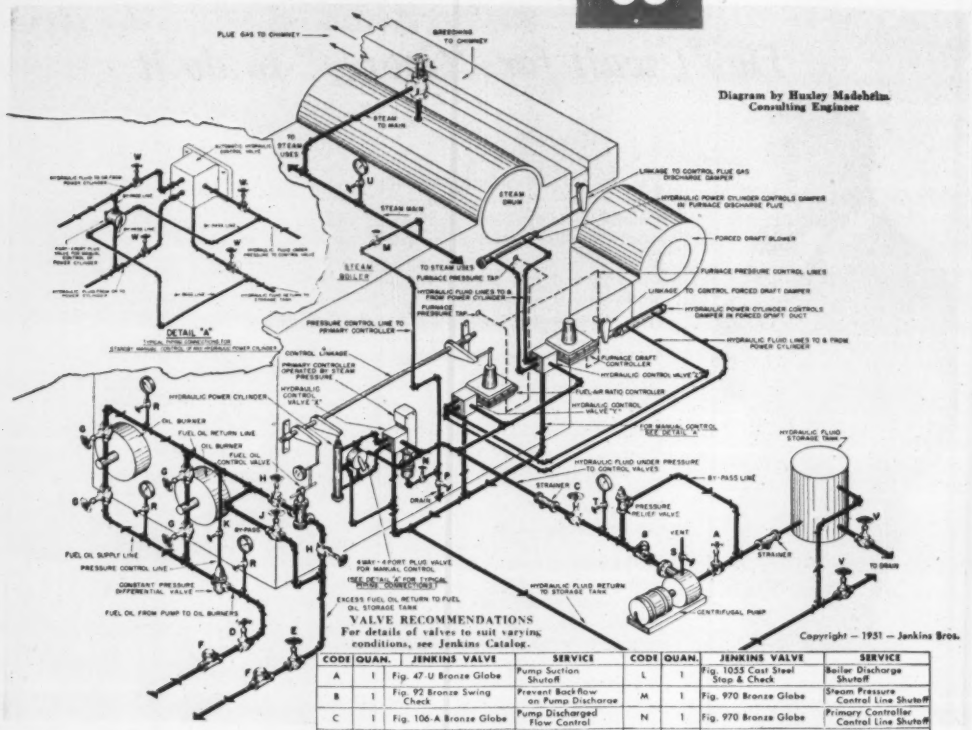
FLUE GAS TO CHIMNEY
BREECHING TO CHIMNEY
STEAM TO MAIN
STEAM DRUM
STEAM BOILER
TO STEAM LINES
STEAM MAIN
LINKAGE TO CONTROL FLUE GAS DISCHARGE DAMPER
HYDRAULIC POWER CYLINDER CONTROLS DAMPER IN FURNACE DISCHARGE FLUE
FORCED DRAFT BLOWER
FURNACE PRESSURE CONTROL LINES
LINKAGE TO CONTROL FORCED DRAFT DAMPER
HYDRAULIC POWER CYLINDER CONTROLS DAMPER IN FORCED DRAFT DUCT
HYDRAULIC FLUID LINES TO & FROM POWER CYLINDER
FURNACE PRESSURE TAP
HYDRAULIC FLUID LINE TO & FROM POWER CYLINDER
PRESSURE CONTROL LINE TO PRIMARY CONTROLLER
DETAIL "A"
CONTROL LINKAGE
PRIMARY CONTROLLER OPERATED BY STEAM PRESSURE
HYDRAULIC CONTROL VALVE "X"
HYDRAULIC POWER CYLINDER
OIL BURNER
FUEL OIL RETURN LINE
FUEL OIL CONTROL VALVE
FUEL OIL SUPPLY LINE
PRESSURE CONTROL LINE
CONSTANT PRESSURE DIFFERENTIAL VALVE
FUEL OIL FROM PUMP TO OIL BURNERS
EXCESS FUEL OIL RETURN TO FUEL OIL STORAGE TANK
4-WAY 4-PORT PLUG VALVE FOR MANUAL CONTROL
FURNACE DRAFT CONTROLLER
HYDRAULIC CONTROL VALVE "Y"
FUEL-AIR RATIO CONTROLLER
HYDRAULIC CONTROL VALVE "Z"
FOR MANUAL CONTROL SEE DETAIL "A"
HYDRAULIC FLUID UNDER PRESSURE TO CONTROL VALVES
HYDRAULIC FLUID STORAGE TANK
BY-PASS LINE
STRAINER C
PRESSURE RELIEF VALVE
VENT
STRAINER
TO DRAIN
HYDRAULIC FLUID RETURN TO STORAGE TANK
CENTRIFUGAL PUMP

Diagram by Huxley Madeheim
Consulting Engineer

VALVE RECOMMENDATIONS
For details of valves to suit varying conditions, see Jenkins Catalog.

CODE	QUAN.	JENKINS VALVE	SERVICE	CODE	QUAN.	JENKINS VALVE	SERVICE
A	1	Fig. 47-U Bronze Globe	Pump Suction Shutoff	L	1	Fig. 1055 Cast Steel Stop & Check	Boiler Discharge Shutoff
B	1	Fig. 92 Bronze Swing Check	Prevent Backflow on Pump Discharge	M	1	Fig. 970 Bronze Globe	Steam Pressure Control Line Shutoff
C	1	Fig. 106-A Bronze Globe	Pump Discharged Flow Control	N	1	Fig. 970 Bronze Globe	Primary Controller Control Line Shutoff
D	1	Fig. 950 Bronze Globe	Fuel Oil Supply Shutoff	P	1	Fig. 976-A Bronze Globe	Steam Pressure Control Line Drain
E	1	Fig. 950 Bronze Globe	Fuel Oil Return Shutoff	R	3	Fig. 741-G Bronze Needle	Fuel Oil Pressure Gage Control
F	2	Fig. 762 Bronze Swing Check	Prevent Fuel Oil Backflow	S	1	Fig. 106-A Bronze Globe	Pump Vent Valve
G	4	Fig. 950 Bronze Globe	Burner Shutoffs	T	1	Fig. 741-G Bronze Needle	Pressure Gage Control
H	2	Fig. 270-U Bronze Globe	Fuel Oil Control Valve Shutoff	U	1	Fig. 703 Bronze Needle	Pressure Gage Control
J	1	Fig. 936 Bronze Globe	Manual Fuel Oil Control	V	2	Fig. 106-A Bronze Globe	Hydraulic Fluid Drains
K	1	Fig. 741-G Bronze Needle	Fuel Oil Pressure Control Line	W	4	Fig. 47-U Bronze Gate	Automatic Control Shutoff

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How to plan AUTOMATIC COMBUSTION CONTROLS

The system shown is the hydraulic control type for a forced draft oil-burning boiler. Small changes in steam line pressure, resulting from fluctuations in steam demand, are transmitted to a primary controller. They actuate hydraulic control valve X, which in turn controls the flow of hydraulic fluid to a hydraulic cylinder.

Furnace pressure from two tapped points in the flue-gas flow stream is transmitted to the fuel-air ratio controller which actuates hydraulic control valve Y. This valve positions a damper in the furnace air supply duct, regulating the flow of air into the furnace to maintain a correct fuel-air ratio.

A draft controller, operated by furnace pressure, is installed to maintain balanced furnace pressure. This balance is effected by hydraulic control valve Z and the power cylinder which operates the flue gas damper.

Manual control of any or all three power cylinders can be accomplished by the installation of a four-way port lubricated plug valve hookup (as shown in insert).

Consultation with accredited piping engineers and contractors is recommended when planning any major piping installations.

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To save time, to simplify planning, to get all the advantages of Jenkins specialized valve engineering, select all the valves you need from the Jenkins Catalog. It's your best assurance of lowest cost in the long run. Jenkins Bros., 100 Park Ave., New York 17; Jenkins Bros., Ltd., Montreal.

COMPLETE DESCRIPTION AND ENLARGED DIAGRAM OF THIS LAYOUT FREE ON REQUEST. Includes additional detailed information. Ask for Piping Layout No. 56.

JENKINS VALVES
LOOK FOR THE DIAMOND MARK
1864 TRADE JENKINS MARK

OBITUARY . . .

the Seattle Contracting Co.

Thos. M. Hill, Sr., 54, retired engineer at the atomic plant at Oak Ridge, Tenn., died at Memphis July 27. Formerly he was with the Kentucky rural highway department.

Albert B. Freville, 86, retired consulting engineer died at Louisville, Ky., July 25.

Arvid G. Johnson, 58, Los Angeles city district engineer for the Harbor area, died July 24. He had been with the city engineering department for 25 years and was working on plans to convert the Point Fermin area into a recreational park.

Howard F. Leavitt, 48, former member of the Natick, Mass., Board of Public Works and Seabee in World War II, died, July 26. Earlier in the month he had done a tour of duty with other Natick National Guardsmen at Pine Camp, N. Y.

Ellis A. Frink, 89, a retired civil engineer died in Washington, D. C., July 25. When he retired in 1938 he had been a bridge engineer for the Seaboard R. R. for more than 40 years.

Walter J. Knight, 70, St. Louis, Mo., consulting engineer, who had designed more than 500 structures, died July 26. He was a graduate of Alabama Polytechnic Institute. He was the author of "Reinforced Masonry Structures" and "Handbook of Building Construction".

Leslie A. Pettus, 57, who was the St. Louis, Mo., engineer in charge of sewers and street paving from 1933 to 1941, died July 8, at Lemay, Mo. He was a veteran of World War I and in World War II assisted in the construction of air fields in Australia and New Zealand. A civil engineer, he at one time taught at Washington University, St. Louis, Mo.

Jeremiah L. Murphy, 84, president and founder of J. L. Murphy, Inc., plumbing and heating contractors, died in New York July 13. A native of Ireland, Mr. Murphy came to the United States in 1881, worked as a plumber, then became partner in the firm Lasette and Murphy in 1900. In 1921 he started his own firm. Six years later, Mr. Murphy helped draft a national plumbing code on the Hoover Committee. His company did installation work on the Empire State Building and for Radio City Music Hall.

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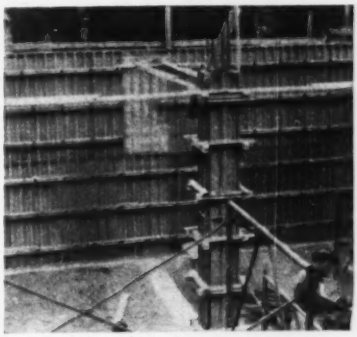

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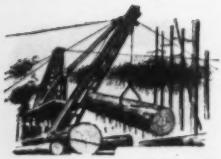
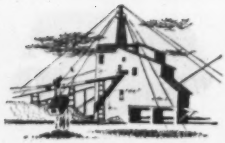
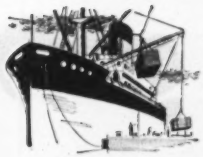


For Logging

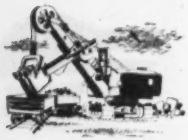


For Sand and Gravel

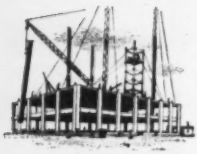
For Aircraft



For Marine

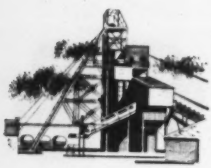


For Stone Quarries



For Construction

For Elevators



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BULLETIN 5025 gives information on "How to order Wire Rope" and lists all sizes and constructions of Improved Plow Steel Monarch Whyte Strand Wire Rope. Copy sent on request.

1005

LABOR

Chances for T-H changes seen improved

With Administration forces beginning to doubt the wisdom of blocking Congressional improvement in the Taft-Hartley Act until after the 1952 elections, labor observers think chances for amending the present law are brighter.

The question became an important one this week, when legislation—sponsored by Senators Taft and Humphrey (ENR Aug. 9, p. 59)—was introduced to restore union shops voted for before top union leaders had signed non-Communist affidavits, and to repeal the requirement for union shop elections in the future.

• **On the spot**—The new legislation puts union leaders and the administration in a dilemma:

If the administration consents to tinkering with the law—and particularly if Taft himself is the tinkerer—the cry of "slave labor act" becomes nonsense. And the administration has been sharpening up that cry for use in 1952.

If the unions accept even this desirable reform now, they probably would give up forever the demand for a return to the Wagner Act.

Another problem is that administration leaders can't guarantee that if the House has another chance at writing labor legislation, it won't come up with a law with even sharper teeth than T-H.

• **Hot seat**—Up to now, the administration has gotten around the dilemma by simply sitting on all attempts to pass amendments that might ease some of the provisions of T-H most onerous to labor.

For instance, the efforts of the building trades to get out from under union shop elections because of impossibility of conducting them were squelched, by Truman and labor leaders (in the AFL).

But now it develops that Richard Gray, president of AFL's construction trades, is the man who got Taft and Humphrey to co-sponsor the new legislation. Gray knew he already had the backing of another moderate Republican—Sen. Irving Ives of New York—who has long wanted to do away with union shop elections (the new bill retains this protection for minority unionists: If 30% petition they want to cancel the union shop, NLRB would then hold an election).

Now, until the union shop election issue is settled one way or another, employers aren't sure whether they should fire a worker for not joining a union where one of the invalidated shop clauses exists. If the employer does fire the worker, he may face suit for back pay in the future; if he doesn't he might incur the wrath of the union.

Taft and Humphrey are pushing for early action on their bill, but it probably can't get through Congress before the end of this year, or next spring.

Wage-price follow up OK'd by WSB

The Wage Stabilization Board's announcement last week that it had prepared directives to permit all employees to get upward wage adjustments comparable to changes in living costs is seen in Washington as part of the Administration's intention to keep wages in line with inflationary living costs.

WSB is only awaiting a final OK from Economic Stabilizer Eric Johnson before issuing a new regulation that would make both Regulation 6 (the 10% catch-up) and Regulation 8 (escalator approval) obsolete.

The action was a complete support of President Truman's statement when he signed the much-amended Defense Production Act July 31. At that time he said: "To the extent that this act permits prices and the cost of living to rise, it will be necessary to allow reasonable adjustments in wages."

• **Key**—Key to the new policy is the decision to preserve so-called "real wages" at what they were last January.

That is, adjustments would be allowed periodically to make allowances for fluctuations in living costs as reflected in the Consumers' Price Index of the Bureau of Labor Statistics. Theoretically, with these adjustments, an hour's work would buy the same essentials of living in the future as it bought when the wage-price freeze went on last January.

Preserving the "real value" of wages as of Jan. 25 is significant and will open the door to much larger wage increases in steel, coal and other industries than would have been possible under the old rules. Until now, WSB has used Jan. 15, 1950, as the base date for measuring cost-of-living wage allowances under the 10% catch up formula. If you advance the date to Jan. 15, 1951, and allow cost-of-living increases since then, the per-

(Continued on page 94)

TILLEY
FLOODLIGHT PROJECTOR
Burns 40 hours on 6 pints of Kerosene

This Model F. L. 6 Floodlight is shown complete with short stand—Weighs 27 lbs. Overall height 26 inches. Also available on 5 to 8 ft. tripod with turntable top—$85.

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• A self-contained unit with no cables—entirely independent of batteries, generators, and the like, which makes it more mobile. Wind and rain proof.

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A McKiernan-Terry S-10 Single-Acting Hammer being used to rebuild the 15-span, single-track railroad bridge over the West Pascagoula River at Gautier, Mississippi. Maxon Construction Company, Inc., Dayton, Ohio, was the contractor.

Here's versatility in action! To drive long piles battered in several directions into deep water, the contractor on this bridge job mounted a McKiernan-Terry S-10 Single-Acting Pile Hammer on a special barge. The versatile piledriver hammered 80 ft spiral-welded pipe piles into place accurately, while A-frame supporting leads were tilted backward and forward by cable-operated stiffleg sliding in slot at rear of barge.

The S-10 McKiernan-Terry Hammer drove through silt, clay, gravel and into fine sand at an estimated load of 150 tons per pile. To develop this resistance, piling had to be driven to penetrations 64 to 89 ft below water level. • This is another example of how powerful, fast-acting McKiernan-Terry Hammers take even the toughest jobs in stride. Bulletin contains complete data on 16 sizes of hammers and 2 sizes of extractors. Write for your copy.

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Labor . . .

centage increase possible gets fairly large.

• **Plan**—WSB's plan is this:

The Regulation 6 10% formula will stay in effect for those who have not exhausted that allowance above the Jan. 15, 1950, base;

The Regulation 8 approval of cost-of-living escalators which were in effect on Jan. 25 will continue indefinitely;

New escalator clauses effective since Jan. 25 (1950) will have prior approval if they meet certain conditions (percentage wage increase does not exceed the percentage increase in the Consumers' index; etc.)

• **Adjustments**—Where there is no escalator clause, employers (with or without a union) may, every six months, raise wages and salaries to restore any decline in "real value" since last Jan. 25. They will not need prior approval, although a report must be sent to the wage-hour office within 30 days of any adjustment.

Any increases granted prior to Jan. 25 will have no effect; nor will any increases made at any time under the 10% formula. In other words, you can go up to the 10%, then add on top of it cost-of-living since Jan. 25.

Strike halts S.F. work

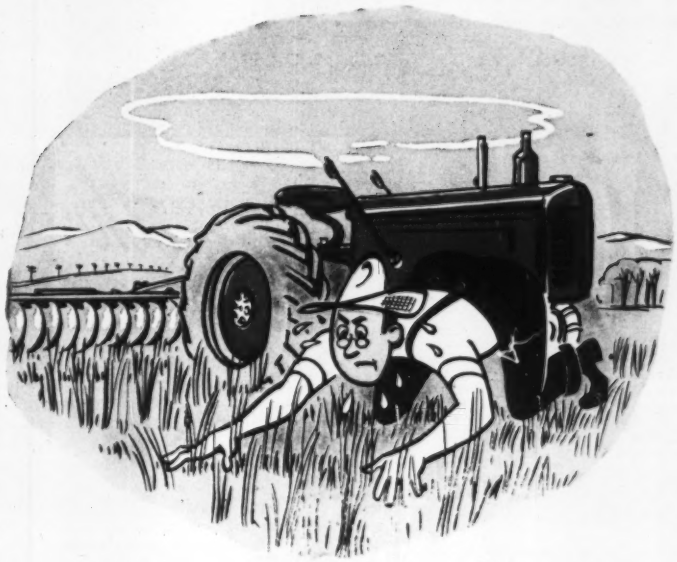
Close to $100 million worth of construction in the San Francisco Bay area stopped last week in a round of labor difficulties. About half the jobs were shut down in a contractor-plumber dispute, the rest by members of the AFL Bridge, Structural and Ornamental Iron Workers union.

The plumbing dispute—termed a lockout by union men—involves plumbers in San Mateo, Santa Clara and San Benito counties. Supported by the local Associated General Contractors chapter and three builders' groups, the "lockout" stems from attempts by the plumbing unions to negotiate separate contracts in the three counties (historically, one master agreement covers all of northern California, including the three counties).

The unions went after individual firms and local associations with demands for raises, health and welfare funds, etc. Contractors retorted that the increases demanded would be above WSB-set limits, and shut down work.

Steelworkers—some 1,100 of them—began picketing 23 steel fabricating plants after failing to reach full agreement on a new contract. They were granted a 14-cent increase, but haven't agreed on an effective date or a reopening clause.

(Continued on p. 97)



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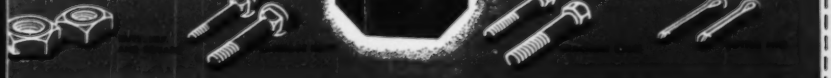

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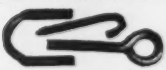
"1035" SET SCREWS: Cup point type, hardened, heat-treated.

COTTER PINS: Steel, Brass, Aluminum and Stainless Steel.

TRACTOR BOLTS: Made to manufacturers' standards.

"1035" CAP SCREWS: Hi-Tensile heat-treated steel.

MILLED STUDS: Concentric, accurate, in a full range of sizes.



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PIPE PLUGS: Forged Steel, heat-treated.

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Labor briefs . . .

• **End St. Louis strike**—The month-old strike of some 600 St. Louis, Mo., sheet metal workers has ended under a compromise agreement between union leaders and sheet metal contractors. Workers are to get a 12½ cent per hour raise, to bring their scale to $2.75, and an additional 7½ cents an hour will be granted if WSB approves.

• **Family fight**—A strike of unionized office workers against the AFL's Operating Engineers and Chauffers & Teamsters unions at Paducah was ended, after business agents conferred. Office workers employed by the two unions had demanded more money and better working conditions from their union employers.

• **Raise for road workers**—Pennsylvania's 14,500 highway workers, paid from state motor fund revenues, have been given a 10% increase, amounting to $3,500,000 annually. A total of 2,500 office workers and 12,000 maintenance men are affected by the new rates.

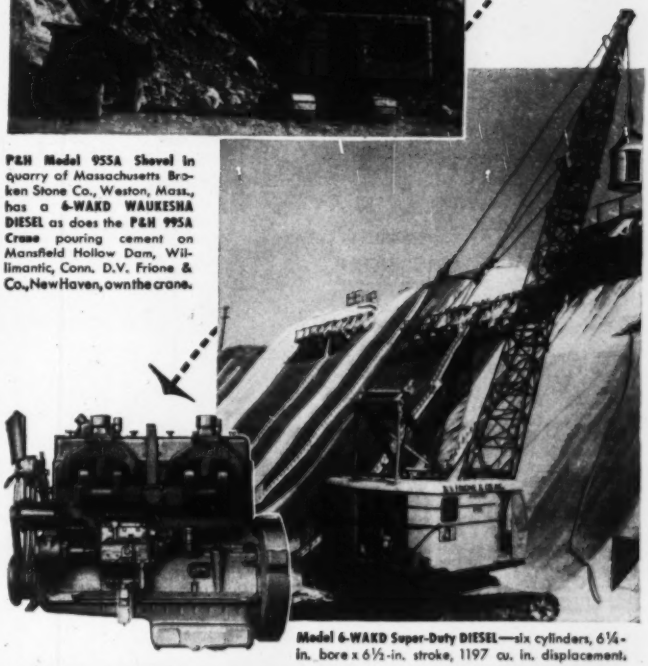
• **D. C. concrete men strike**—Truck drivers for four Washington, D. C. ready-mix concrete concerns walked off their jobs in Prince George's County in a move to obtain shorter work week, pay increases, and a health-welfare fund. They wanted contracts similar to those won with five District and Virginia ready-mix organizations recently.

• **Strike confines soldiers**—A strike of construction workers on projects totalling $28 million involved in reconstruction and rehabilitation of Keesler Air Force Base at Biloxi, Miss., kept 20,000 air force personnel confined to the base last week, as commanders said that safety of personnel dictated confinement to the post. The dispute was between labor unions and contractors working on the base, picket lines holding up deliveries and shutting down work on the construction contracts.

• **Electricians get raise**—The AFL International Brotherhood of Electrical Workers, Local 1, at St. Louis, Mo., was granted an increase of 12½ cents hourly, bringing the current rate to $2.75 an hour, under terms of a one-year contract signed by the union and the St. Louis chapter of the National Electrical Contractors Association. Some 1,200 electricians in construction work in the area are affected by the contract, completed after nearly four months of negotiation.

Quarries to Dams

P&H Model 955A Shovel in quarry of Massachusetts Broken Stone Co., Weston, Mass., has a 6-WAKD WAUKESHA DIESEL as does the P&H 99SA Crane pouring cement on Mansfield Hollow Dam, Willimantic, Conn. D.V. Frione & Co., New Haven, own the crane.



Model 6-WAKD Super-Duty DIESEL—six cylinders, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement.

WAUKESHA Diesel POWER

139

• **Trigger quick, but smooth and slick—the Waukesha Super-Duty Diesel snaps right into it, almost the same second the shovel operator puts on the power. It's that *fast recovery* that makes a Waukesha Diesel so different. And you can tell the difference, too—in loads per minute. Operators, contractor-owners, and shovel-makers agree on that. With Harnischfeger Corporation of Milwaukee, Wis., the Waukesha 6-WAKD Diesel is standard equipment on their P & H Model 955A 2½ to 3 cubic yard shovels, draglines, and cranes, that are so versatile on such a variety of construction jobs. Pictures show two of them at work.**

Like all Waukesha Diesels, this Super-Duty Six has many exclusive design features. Most outstanding is the patented spherical combustion chamber. That's the *why* of Waukesha Diesels' unusual performance—the lively, responsive acceleration, smooth, shock-free operation, clean and complete combustion with high fuel economy and low maintenance. Get all the details—send for Bulletin 1415.

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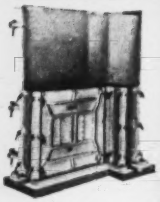

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Saves you time, trouble and money—just as it has thousands of satisfied users across the country. The result of many years' practical experience specializing in surface treating asphalt pavements—SUPER SEAL makes blacktop stay smooth, even, trouble-free, permanent, gives blacktop a future!

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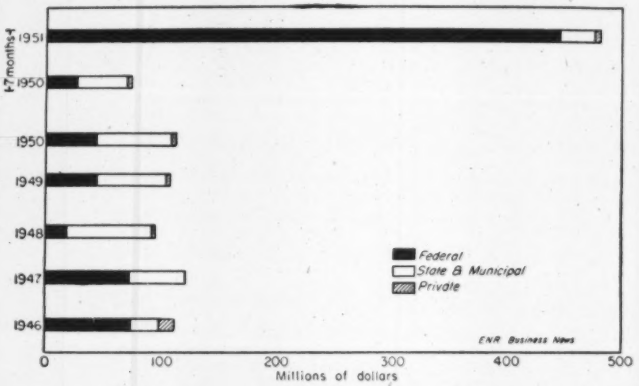
CONSTRUCTION BUSINESS



U.S. is top airport construction buyer

The biggest—and fast becoming the only—buyer of airport construction is the Government of the United States, according to ENGINEERING NEWS-RECORD's compilation of airport construction contracts.

Thrown into high gear to meet the needs of the expanding defense program, federal airport construction rocketed to $477 million during the first 7 months of 1951—93% of all airport construction and an amazing 1500% increase over the first 7 months of 1950.

At $480 million, total airport construction hit the highest level in the postwar period. It was 478% above the first seven months of 1950. Even more impressively, it was at least four times as much as contracted for in any full year since the war.

The strong upsurge in federal airport construction includes building more airbases as well as expanding existing ones. Since 1950, emphasis has shifted from hangars and buildings to new airfields and to the extension of runways and taxiways at older fields.

• **Civilian work drops**—While the construction of military airbases has been going ahead full tilt, the brake has been put on new civilian airports.

State and municipal airports, which took from 58% to 80% of the total during 1949-50, took only 6.5% in the first 7 months of 1951. At the same time they dropped 28% under 1950, with a total of $31 million compared to $43 million in 1950.

Private airport construction has been only a tiny part of the whole since 1946, when it accounted for 21% of all airport construction. So far this year only $3 million in contracts were let for private airports. That was 21% under the total for the first 7 months of 1950 and represents a drop from 3% of all airport construction in 1950 to less than 1% of the total so far in 1951.

Building backlog mounts $845 million for July

After a pause a month ago ENGINEERING NEWS-RECORD's measured backlog of construction leaped far ahead for July, to register a net gain of $845.3 million.

At the end of the first seven months of 1951, the cumulative backlog stood at $57,553,398,000.

• **New start?**—The huge gain in total projects proposed but not yet put under construction for July may be a resumption of a trend that started with the first month of 1951 (when $1,068 million was recorded as net gain), slowed somewhat in March and April, spurted again in May, but dropped very sharply (to $43 million net gain) in June (ENR July 19, p. 101).

With the July gain added, the monthly rate of gain for 1951 is now $777 million.

• **Pattern**—The backlog picture generally fell into a well-defined pattern, with planning for private work of all kinds keeping pace with public projects.

General private construction, with a total as of July of $21,307 million on the planning shelves, went up $342 million over June. Biggest components of that total were industrial

(*Continued on page 100*)

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It's all in the RIGHT KIND of Muscle

The powerful, rugged muscles of a charging rhino enable him to propel his tremendous bulk and weight at truly remarkable speed. Nature designed them well for the purpose they have to serve.

In wire rope, too, the right kind of muscle is vitally important... because different types of jobs present different types of destructive forces. Bending fatigue! Shock stress! Abrasion! Load strain! Each demands wire rope that best combines the required resistance characteristics.

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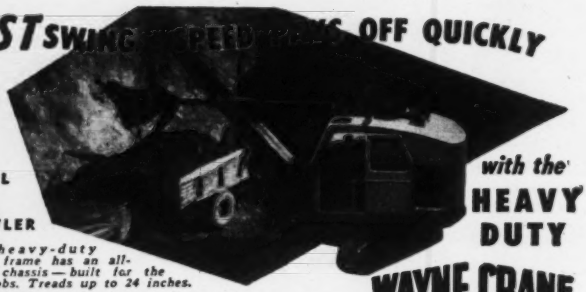

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This heavy-duty crawler frame has an all-welded chassis — built for the tough jobs. Treads up to 24 inches.

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...INCREASES OUTPUT—SAVES TIME ON EVERY JOB

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One owner says, "Here is a ½-yd. shovel that moves more dirt than larger machines working on the same job." Others report the same because actually Wayne Crane has the fastest swing speed on the market—6½ r.p.m.

The Model 66 is a HEAVYWEIGHT in the ½-yd. class—31,978 lbs. as a shovel proves it—the extra weight is at points of greatest stress—this means more built-in hours of profitable operation.

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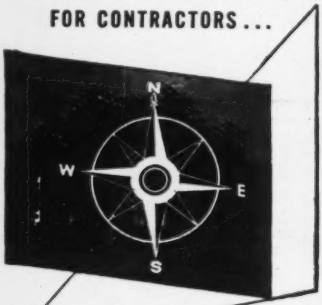

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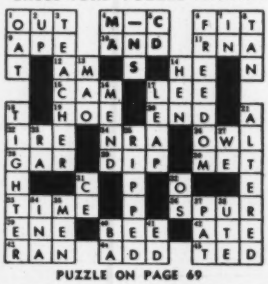


PUZZLE ON PAGE 69

Construction business . . .

construction, which registered a net gain of $140 million for the month; and unclassified, up $172 million.

Commercial buildings—most heavily hit by controls—gained least, going up $29.1 million over the cumulative total for June.

Public construction, with an overall total of $36,245 million on the planning shelves, rose $499.9 million for the month of July.

Biggest factor in this jump was in unclassified work, which showed a gain of $360 million for the month. Next in line was public buildings, up $134 million.

Three categories of public works, however, showed losses during the month, as more projects were advanced to active construction stages than were proposed. These were: waterworks, down $4.8 million; sewerage, down $2.6 million; earthwork and waterways, down $9.5 million.

HHFA OK's model law for substitute materials

Raymond M. Foley, administrator of the Housing and Home Finance Agency, has announced approval of a proposed model emergency building ordinance to permit local building officials to authorize use of alternate materials and techniques during the present emergency, when certain required materials are in short supply.

The ordinance was written by HHFA officials and reviewed and unanimously approved Friday, July 27, by HHFA's Advisory Committee on the Administration of Local Building Regulations—a group composed of building officials and specialists in municipal regulations from various parts of the United States. The ordinance will be printed and made available for public distribution in the near future.

"While many existing codes provide the local building official with authority to approve alternate materials and methods under standards which will protect public health, safety, and welfare," said Foley "a large number do not contain such authority, even for emergency administration in periods of shortages. This ordinance is designed so that it can be adopted by any locality, with proper modifications to meet local requirements.

• **Conserves material**—"During national emergencies, certain critical materials may be required by local building regulations, but may not be available. Yet certain construction and repair must go forward.

This emergency ordinance, when locally adopted, permits local build-

ing officials to approve the use of alternate and techniques when such an emergency arises."

Mr. Foley explained that the document consists of three parts: (1) the introduction, which explains the necessity for such an ordinance; (2) the ordinance itself; and (3) explanatory notes on the ordinance to point up its principles and the purpose of its provisions, and indicate which provisions need local modification to fit local needs.

HHFA's acting Director of Research Joseph Orendorff indicated how the proposed ordinance might be used by localities: Local officials may find it desirable or necessary to authorize use of plastic or porcelain outlet boxes instead of steel in household electrical systems; in some kinds of masonry construction, lightweight aggregates might be used instead of heavier sand and stone for concrete; increased stress allowances on steel members in buildings; other alternates can be approved for household plumbing and heating systems.

Canada has seven big construction months

The first seven months of 1951 found Canada with construction contracts amounting to $1,505,128,700, a sum more than double the total for the first seven months of 1950, according to a report of MacLean Building Reports Ltd. of Toronto.

July of this year ran at $326,822,900—an increase of $175,783,100, over same period 1950.

Engineering jobs in western and eastern Canada more than made up lost dollar volume in the areas of residential building. Biggest new projects include the often reported $160 million aluminum job in British Columbia and along the Atlantic Coast provinces.

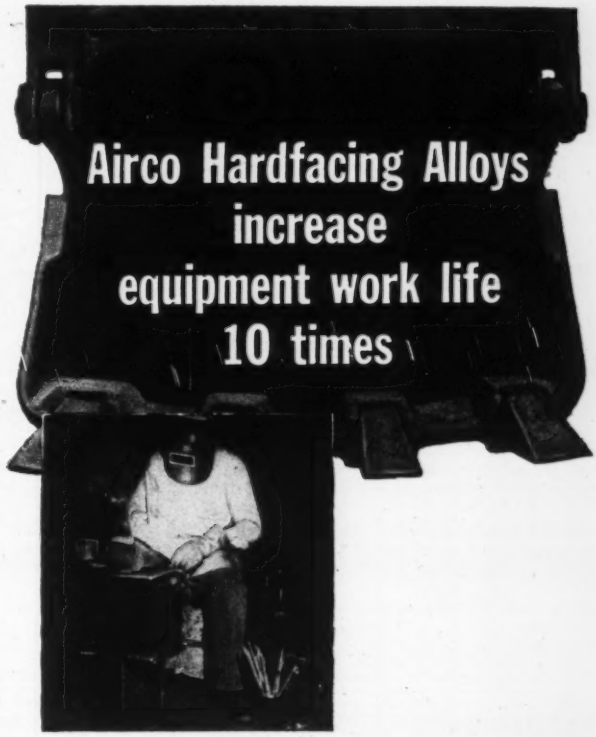
Commerce sees $2.8 billion construction in July

New construction valued at nearly $2.8 billion was put in place during July, the Building Materials Division of the Department of Commerce, and the Bureau of Labor Statistics said last week.

The preliminary estimate of outlays in July represented an increase of 3% over June and the same percentage increase over the July, 1950, figure.

The government agencies said that increasing effects of restrictions on building became evident in July. Private homebuilding activity, they said, failed to show the usual sea-

(Continued on p. 102)



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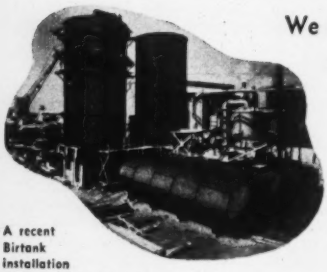
when you have a tank problem



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Construction business . . .

sonal increase and was about 30% under last year's record rate. Commercial building began to drop and there was a continued decline in construction of social and recreational facilities.

Total private outlays for new construction amounted to $1,858 million —2% above June. Public construction expenditures were $932 million.

Business briefs . . .

• **Bond financing up**—State and municipal bond financing during July totalled $312.6 million, compared with $206.9 million for July, 1950. In the same month, municipalities approved bonds worth $56 million, much of that amount to go for public works.

• **Clay products up**—Production of most classes of clay products rose slightly during May, the Bureau of the Census reported. Unglazed brick production for May was 605 million units; clay sewer pipe production was 145,000 tons; unglazed structural tile, 106,000 tons.

• **Levitt buys land**—Apparently planning to go ahead with plans for mass-construction of homes in Pennsylvania's Bucks County (ENR July 26, p. 77) Levitt & Sons, Inc., has purchased about 2,000 acres of land. The site is near U. S. Steel's new Morrisville (Fairless) Works.

• **Lumber production stays up**—Continuing its long trend of high production, the nation's lumber industry again ran ahead of demand for the week ending July 28, the National Lumber Manufacturers' Association reported last week. Shipments for the week were 16% below production; new orders were 16.4% below.

• **Portland cement output**—Output of finished portland cement during June, 1951, continued high, maintaining a level about 10% above last year. Production was 21,984,000 barrels.

• **New Alcoa plant**—Aluminum Company of America has announced plans for a new plant which it says will be the first in history to use lignite for fuel.

• **$186 million quick write-off**—Certificates of necessity for 125 new plants, to cost a total of $186.8 million were approved by DPA for the week of July 27-Aug. 3 inclusive. Biggest plant was a $78 million ferro-alloys and calcium carbide plant for Union Carbon & Carbide Co. at Marietta, Ohio.

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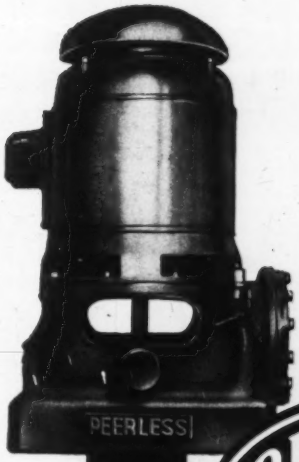
OF A DEEP WELL PUMP FOR SHORT OR MEDIUM SETTINGS



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Up to 1000 feet

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H.P. RANGE
Up to 2,500 h.p.

DRIVES
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Choice of oil or water lubrication.

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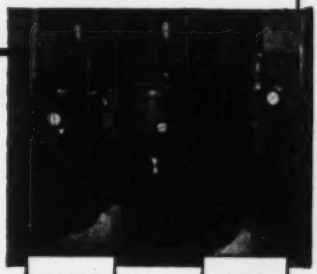

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more dirt... faster
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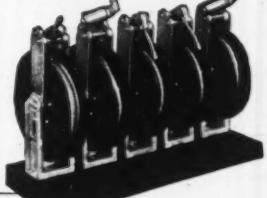

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UNIT PRICES BID BY CONTRACTORS

Eklutna Tunnel, Alaska

Both more than $10 million above the engineer's estimate, only two bids were opened June 25 by the Bureau of Reclamation on the Eklutna Tunnel in Alaska. A low bid of $21,321,695 was 6.5% below the other bid.

Part of the Eklutna Project, the job consists of the construction of 22,000 feet of concrete-lined tunnel and a surge tank. Located approximately 30 miles northeast of Anchorage, midway between Anchorage and Matanuska Valley, the tunnel will extend from Lake Eklutna through Goat Mountain to a point 800 feet above sea level near Palmer Highway.

Minimum wage rates are: building laborers, $2,735; tunnel retimbermen, $3.02; powermen, $3.12; piledrivermen, $3.185; and truck drivers, $2.84–$3.17.

Bidders included:

1 Peter Kiewit Sons. Co., Omaha, Neb., & Morrison-Knudsen Co. Inc. of Boise, Idaho	$21,321,695
2 Wm. A. Smith Contracting Co., Inc., Kansas City, Kan., & Brown & Root, Inc., Houston, Tex.	22,798,432
Engineer's estimate	11,205,105

Items	Quantity	Unit prices 1	2
Excav. open cut, for inlet, 1st 205,000 cy	205,000	$6.00	$2.20
Over 205,000 cy	205,000	2.00	1.10
Constr & inst intake trashrack section	ls	480,000	735,000
Int transition sec	ls	120,000	735,000
In bulkhd sec	ls	80,000	735,000
Furnish & inst 9' dia precast conduit	lf	225	2,500	3,000
Constr tun'l between sta 20+00 & 27+11.50	lf	711.5	2,500	3,000
Excav. in open cut for gate shaft	cy	21,000	3.00	0.75
For gate shaft	cy	920	500.00	235.00
For surge tank	cy	5,700	175.00	16.00
In tun'l	cy	87,600	100.00	75.00
For tun'l enlargement	cy	200	100.00	110.00
Backfl about intake struct	cy	1,000	10.00	8.85
Perm steel tun'l support, f i	lb	1,975,000	0.25	0.40
Perm timber in tun'l, f e	Mbm	795	400.00	1,000
Tun'l roof support bolt, f i	lf	12,200	3.00	4.40
Drill, feeler or pilot hole ahead of tun'l excav	lf	2,500	10.00	7.40
Grout holes	lf	2,500	10.00	7.40
Grout pipe & connect, f p	lb	7,500	0.60	4.40
Pressure grout	cf	25,000	5.00	7.40
Conc. in gate shaft	cy	390	200.00	300.00
In surge tank	cy	1,235	200.00	210.00
In tun'l lin'g	cy	27,420	100.00	150.00
Around pen-stock	cy	3,070	100.00	150.00
Cement, f & handle	bbl	54,500	10.00	20.00
Reinf bar, f p	lb	5,651,000	0.20	0.32
Penstock, inst	lb	955,000	0.20	0.35
Frames, guide for blkhead & fixed-wheel gate & hoist support beam, i	lb	24,000	0.10	0.35
Fix-whl & blkhd gates, i	lb	41,000	0.10	0.22
Fix-whl & blkhd gate hoist, i	lb	21,000	0.10	0.35
Control apparat., pipe for blkhd & fix-whl gate, i	lb	2,250	0.50	1.60
18" dia vent pipe, f i	ls	.....	5,000	5,200
Gate shaft & surg tank metl wk, i	lb	14,000	0.40	1.15
Struct st in surg tank roof, e	lb	7,200	0.40	0.75
Steel swing door, f i	sf	20	15.00	7.40
Excav, strip borrow area & surf of dam embank	cy	300	3.00	4.40
Earth-fil embank for dam	cy	500	1.00	4.40
Sand & gravel blanket under riprap	cy	60	4.00	7.40
Riprap	cy	2,000	8.00	9.00
Constr anchor & extension to exist sheet st pil	ls	.....	12,000	19,000
Timb pile, f, drive	lf	750	5.00	9.00
Moving deck of exist trestle	ls	.....	25,000	4,400

Note:
f—furnish; i-install; e—erect; p—place

Control structures for Delaware-Raritan Canal

The Division of Water Policy and Supply of the Dept. of Conservation and Economic Development at Trenton, N. J., awarded the contract for control structures on the Delaware and Raritan Canal to a low bid of $139,625 on June 14. A total of six bids were received, 39% apart, with the low bid 3.3% below the second bid. Robert L. Hardman is the engineer.

Located in Hunterdon County, the work includes the construction of control gate structure, 17½ feet high and incorporating four sluice gates, 36 feet by 48 feet for control of the water through 80 foot length of walled channel; and a spillway structure, 200 feet long and 9 feet high.

Sluice gates and joint mastic will be provided by the owner. Transportation to the project is available from rail (one mile from the job) and highway. Work must be completed by February 1952. Class B concrete, called for in the specifications, contains a maximum allowance of 6 gallons of water per sack of cement; Class C, 6½ gallons.

Wage rates to be paid are: common labor, $1.85; semi-skilled, $2.25; and skilled, $2.75.

Bidders were:

1 Harrison & Burrowes, Inc., Jersey City, N. J. (contract)	$139,625
2 Edward H. Ellis Sons, Inc., Merchantville, N. J	144,339
6 Construction Service Co., Bound Brook, N. J	228,915

Items	Quantity	Unit prices 1 C	2
Remove existing struct	ls	.....	$7,000	$1,500
Cofferdam & pumping	ls	.....	18,000	24,000
Excav, channel	cy	4,400	1.25	3.50
Foundation	cy	750	2.50	3.50
Rock	cy	750	6.00	7.00
Concrete, Cl B	cy	450	55.00	40.00
Cl C	cy	850	50.00	50.00
Reinf steel	lb	46,000	0.20	0.20
Pneumatic-applied mortar	sf	3,200	2.00	2.25
Const & inst bar screens	ea	4	500.00	850.00
Riprap slope pav	sy	2,000	2.50	1.25
Inst sluice gate	ea	8	300.00	115.80
Clean up	ls	.....	500.00	1,838
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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager — *J. A. MAHONEY, Reports* — *M. R. ROESSLER, Statistics*

NEW ENGLAND

SOON LETS CONTRACT—BUILDINGS

Mass., Brockton—SCHOOL—St. Edward's R. C. Church, Chancery Office, Lake St., soon lets contract, parochial school, auditorium, gymnasium, E. Main St., $500,000. CD 7/9.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

VERMONT—State Hy. Dpt.,, State House Montpelier, **Bayer & Migolla Constr. Co.,** 90 Lincoln St., Worcester, Mass. CA **$72,723.** hy., Williston.
W. H. Hinman, Inc., North Anson, Me. CA **$72,934.** hy., St. Johnsbury. Bids July 27.

BUILDINGS

LOW BIDS AND CONTRACTS

Gordon & Sutton, 227 Houghton St., North Adams, Mass. LB **$346,000.** Greylock elementary SCHOOL, NORTH ADAMS, MASS. City, School Dpt., City Hall, North Adams, Mass. Arthur L. Eldridge, 85 Main St., North Adams, Mass., archt. Bids July 26. CD 7/11.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

Del., Wilmington—B.A. 8/21—Levy Court of New Castle Co., Public Bldg., Wilmington, Suburban Development, Contr. No. SD-38, Old Deerhurst New Castle Co. Plans deposit $2. John Taylor, co. engr.

N. Y., New York—B.A. 8/21—Bd. Water Supply, 120 Wall St., Zone 5, Contr. 412, furnishing, testing, del. eight 48 in. and two 36 in. cast steel motor-operated conical plug valves, two 42 in., two 24 in. and one 12 in. c.i. motor-operated concical plug valves, one 14 in. c.i. manually operated conical plug valve, one 20 in. c.i. motor operated gate valve, pipe couplings, misc. valves for installation in the intake and outlet chambers of the Neversink Tunnel, the Downsville release water chamber and the outlet chamber of the East Delaware Tunnel of the Delaware Aqueduct CD 6/16/44.

N. Y., Brooklyn—B.A. 8/22—Dpt. P. Wks., Municipal Bldg., New York 7, N. Y., reconstruction roadway and footwalks on movable and fixed spans of Third Street Bridge. Plans deposit $5.

N. Y., Colonie—B.A. 8/23—Town Bd., Colonie, addnl. water supply for Latham Water Dist., filter plant, aerator, pumping station and reservoir.

N. J., Ancora—B.A. 8/24—At Office Fred V. Ferber, dir. Division Purchase & Property, State House, W. State St., Trenton, Zone 7, constr., erection one 400,000 gal. double ellipsodial steel water tank and tower, incl. foundations and accessories at Fourth Mental Hospital, Winslow Twp.; adv. ENR 8/9. Plans deposit $25.

BIDS ASKED—BUILDINGS

Md., Frederick—SCHOOL—B.A. 8/20—Frederick Co. School Bd., East Church St., 1 story, brick, concrete, steel East Frederick School, Rte 40, east of Frederick, $300,000. Paul Kea & Assoc., 5109 Baltimore Ave., Hyattsville, archts. CD 3/15.

N. J., Marlboro—B.A. 8/21—At Office of Fred V. Ferber, dir., Div. Purchase & Property, State House, W. State St., Trenton, Zone 3, general work, structural and misc. iron work, plumbing heating and ventilation, electrical work and elevator for Senile Bldg. at New Jersey State Hospital. Plans deposit $25. CD 10/9/50.

† **N. J., Dover**—PLANT—B.A. 8/21—U. S. Eng., 80 Lafayette St., New York, 13, N. Y., cost propellant power plant and bldg., etc. at Picatinny Arsenal. Extended date. CD 5/31.

N. Y., Flushing—HOUSING IMPRVS.—B.A. 8/21—New York City Housing Auth., 63 Park Row, New York 38, N. Y., topsoil and planting for Pomonok Houses, Proj. NYG-22) located in area bounded generally by 71 Ave., Kissena Blvd., 65 Ave. and Parsons Blvd., Queens Boro. Plans deposit $25.

N. Y., Flushing—HOUSING IMPRVS.—B.A. 8/21—New York City Housing Auth., 63 Park Row, New York 38, N. Y. construct street and yard imprvs. for Pomonok Houses. Proj. NYC-22 in area bounded by 71 Ave., Kissena Blvd., 65 Ave., and Parsons Blvd., Queens Boro. Plans deposit $25. Extended date. CD 7/19.

▲ **Pa., Erie**—SCHOOL—B.A. 8/23—School Dist. of Millcreek Twp., Erie 2 story, steel, brick, block school. $1,512,000. Meyers & Krider, 407 Commerce Bldg., archts.

Pa., West Hazleton—SCHOOL—B.A. 8/23—Public School Bldg. Auth., 1400 N. Cameron St., Harrisburg, Junior and Senior High School addns. for West Hazelton School Dist., $440,000. Plans deposit $25. C. R. Greiner c/o owner, ch. engr. Philip G. Knobloch, 1811 W. Market St., Potsville, Pa., archt.

N. J., Paulsboro—ADMINISTRATION—Bids Asked—Socony Vacuum Oil Co., Paulsboro, administration bldg. $300,000. Robert C. Martin, 1700 Walnut St., Phila., Pa., archt.

SOON LETS CONTRACT—BUILDINGS

N. J., Haddonfield—SCHOOL, etc.—Roman Catholic Diocese of Camden, 721 Cooper St., Camden, soon lets contract, school and auditorium, $300,000. Ricker & Axt, 6105 Hudson Ave., West New York, N. Y., archts. CD 4/2.

Pa., Drexel Hill—SCHOOL—T. Norman Mansell, archt., 262 S. 17 St., Phila., Pa., soon lets contract school and convent addn. for St. Andrews Roman Catholic Church, Drexel Hill, Pa. $300,000.

Pa., Phila.—CHAPEL, etc.—Henry D. Dagit & Sons, archts., 1329 Race St., soon lets contract chapel and mother house for Missionary Servants of Most Blessed Trinity, 3501 Solly St., $300,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Albert A. Lutz Co.,** 241 E. 17 St., New York, N. Y. CA **$3,490,626.** Exten runways at Floyd Bennett Field, BROOKLYN, N. Y. Pub. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York 7, N. Y. Bids June 29. CD 6/27.

▲† **Stock Constr. Co.,** Grand Central Terminal Bldg., New York 17, N. Y. CA **$3,452,200** addnl. facilities at Griffin Air Force Base, ROME, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. CD 3/29.

NEW JERSEY—New Jersey Turnpike Auth., Veterans Room War Memorial Bldg., Trenton.
Lightning Electric Service Co. of **Newark,** 11 Coe's Place, Newark, N. J. and **Emerson Garden Electric Co.,** 40 W. Scott Pl., Elizabeth, N. J., CA, **$516,625,** Contracts 83 and 84, installing lighting fixtures at interchange and services areas of N. J. Turnpike in Union, Essex, Hudson, Bergen and Middlesex Counties. Bids June 28, awarded July 26. CD 7/5, under LB.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, N. J.,
Cayuga Foundation Corp., 30 Vesey St., New York, N. Y., LB. **$1,236,576,** constr. Route 26 Extension (Trenton Freeway) from Perry St. to Penna. R.R. (Belvidere and Delaware Branch incl. bridges, retaining walls and grading, Mercer Co. Bids Aug. 2. CD 7/25.

† **M. B. Markland Contg. Co.,** 1325 Boardwalk, Atlantic City, N. J., CA, **$60,000,** swimming pool, CAPE MAY, N. J. U. S. Treasury Dpt., Coast Guard, Receiving Center, Cape May, N. J.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
B.A. Bids Asked
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg.
Charles Bolagich, Jefferson, Pa. LB **$8,507,845,** wid'n. c. conc., aggregate bit. surf. 29,875 ft. Hy. T.R. 601, 53, Boswell Boro, Jenner, Conemaugh and Upper Yoder Twp., Somerset and Cambria Counties.
The S. T. Brotemarkle Constr. Co., P.O. Box 393, Cumberland, Md., LB **$231,539,** conc. aggregate bit. surf. 12,359 ft. hy. T.R. 253, and 865, Reade Twp., Cambria Co.
A. B. Cole, Meshoppen, Pa., LB **$379,458,** wid'n. roadway, conc. aggregate bit. surf. 27,595 ft. T.R. 106, Montrose Boro, Jessup and Bridge Water Twps., Susquehanna Co.
Chas. H. Fry Constr. Co., 1902 Cherry St., Erie, Pa., LB **$268,138,** resurf. bit. surf. 8,825 ft. hy. T.R. alternate 5, Erie City, Erie Co.
Paul Kebert, R.R. 6, Meadville, Pa., LB **$108,556,** wid'n. c. conc. bit. surf. 3,621 ft. T.R. 8, U.S. 6, Union City Boro, Union Twp., Erie Co.
Mayer Bros. Constr. Co., 1227 W. 18 St., Erie, Pa. LB **$356,318,** resurf. bit. surf. 29,140 ft. roadway T.R. 5 and 20, Erie City, Lawrence Park and Mill Creek Twp., Erie Co.
Ryan Bros., Inc., Clearfield, Pa. LB **$473,281,** c. conc. pavement 12,367 ft. T.R. 8, Titusville City, Cherry Tree Twp., Venango and Crawford Counties.
Herman W. Riebe, c/o Charles Riebe, Lansford, Pa. LB **$223,398,** wid'n. bit. plant cement conc. base resurf. 6,683 ft. T.R. 24, York and Spring Garden Twps., York Co.
Slaw-Landis Paving Co., Rock Hill Rd., Bala-Cynwyd, Pa., LB, **$95,890.** wid'n. crushed aggregate base, bit. surf. 24,435 ft. T.R. 320, Marple, Haverford and Radnow Twps., Delaware Co. Bids Aug. 3. CD 7/23.
Western Constr. Co., 2412 S. Juniper St., Phila., Pa., CA **$449,447,** main sewer in Castor Ave., etc., PHILA., PA. Dpt. P. Wks., City Hall Annex, Phila., Pa. Bids May 10. CD 5/2.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2.
Harry T. Campbell Sons Corp., Towson, Md. LB **$175,-339.** conc. wedge leveling 4.753 mi. along Littlestown Pike US Rte. 140, beginning point approx. 0.11 mi. south of bridge over Big Pipe Creek in Union Mills and exten. northwesterly to Pennsylvania State Line. Contr. CL 305-2-315, Carroll Co. Bids July 31. CD 7/23.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **John W. Harris Assoc.,** 30 Rockefeller Plaza, New York, N. Y. CA **$1,200,000.** MFG. BLDG., FARMINGDALE, N. Y. Republic Aviation Corp., Conklin St., Farmingdale, N. Y. Bids July 17. CD 7/18.

† **Roberts-Nash Constr. Co.,** 39-15 Main St., Flushing, N. Y. CA. **$883,700.** LABORATORY Bldg. 2, Brookhaven Natl. Laboratories, PATCHOQUE, N. Y. U. S. Atomic Energy Comn., Upton, N. Y. Bids 6/25. CD 6/13.

▲ **Bd. Educ., Town of Eastchester,** Stewart Pl., Tuckahoe, N. Y., rejected bids June 25, HIGH SCHOOL addn., on Stewart Pl., **$467,000;** elementary school, Mill Rd. at Eastchester **$989,000;** Greenvale School addn., William St., at Eastchester, **$358,000** TUCKAHOE, N. Y. CD 6/13.

Vincent J. Smith, Inc., Box 551, Binghamton, N. Y. CA **$735,000,** Contr. 1, general contract for 100 DWELLING UNITS, Proj. NY 10-1, along Eastern Blvd., WATERTOWN, N. Y. Watertown Housing Auth., 36 Flower Bldg., Watertown, N. Y. Bids June 26. CD 5/28.

20th Century Homes, Inc., 27 St. and Marlton Pike, Camden, N. J. Separate Contracts, **$300,000,** RESIDENTIAL DEVELOPMENT, Cottage St. BRIDGETON, N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, N. J., archt.

City, Clifton, N. J., rejected bids July 12 library, Plaqut and Third Aves., CLIFTON, N. J. CD 7/6.

John W. Ryan Constr. Co., 369 Lexington Ave., New York 17, N. Y., CA, **$760,000** research LABORATORY, SUMMIT, N. J. Ciba Pharmaceutical Products, Inc., Morris Ave., Summit, N. J. Harvey P. Clarkson, 132 E. 58 St., New York, 66, N. Y., archt.

▲ **Fred J. Brotherton, Inc.,** 185 Atlantic St., Hackensack, N. J. LB **$1,991,834.** Overlook HOSPITAL addn. SUMMIT, N. J. Bd. Trustees Overlook Hospital, Summit, N. J. CD 7/2.

Lewis C. Bower & Son, Inc., 180 Nassau St., Princeton, N. J. CA. **$208,939,** 1 story, 140x200 ft., TILE LABORATORY, NEWTON SQUARE, PA. Certain-Teed Products Corp., 120 E. Lancaster Ave., Ardmore, Pa.

John De Paul, 1927 Middleton St., Phila., Pa., CA, **$200,000,** 2 story, brick MANUFACTURING, PHILA., PA. Graco Metal Products Co., 2960 E. Venango St., Phila., Pa. CD 5/22.

Finestone Bros., 514 E. Roosevelt Blvd., Phila., Pa. Separate Contracts, **$300,000,** RESIDENTIAL DEVEL-

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OPMENT, Bennington St., PHILA., PA. L. J. Cowan, 1505 Pine St., Phila., Pa., archt.

Fleming Co., 1717 Sansom St., Phila., Pa., CA, $995,000, Stephen GUARD BLDG. alterations, etc. PHILA., PA. Phila. Bd. City Trusts, 120 S. 3 St., Phila., Pa. Bids July 2. CD 6/25.

Herman Glazer, 206 S. 42 St., Phila., Pa., CA $300,000. HOMES, Dover St. near Moore St., PHILA., PA. Master Homes, Inc., c/o L. J. Cater, Land Title Bldg., Phila., Pa.

Joseph A. Meloney & Sons, 302 E. Essex Ave., Lansdowne, Pa. Separate Contracts, $504,009, RESIDENTIAL DEVELOPMENT, Springfield Rd., etc., PRIMOS, PA. James G. Ludwing, 225 S. 69 St., Upper Darby, Pa., archts.

▲ **Phillip Vizzini & Son**, 504 Stamford Rd., Baltimore, Md. LB $1,317,450, est. $1,410,000. 2 story, bsmnt., brick, steel, cinder block, L-shaped Southwest Baltimore Elementary SCHOOL, BALTIMORE, MD. City Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore 2, Md. Bids Aug. 1. CD 7/23.

T. Calvin Owens, 2708 26 St. N. E., Wash., D. C. LB $616,856, 3 story, brick, cinder block, concrete, steel Bethesda-Chevy Chase Senior High SCHOOL, ROCKVILLE, MD. Montgomery Co., Bd. Educ., Rockville, Md. Rhees E. Burket, 1223 Connecticut Ave. N. W., Wash., D. C., archt.

Loch Ridge Constr. Co., 5716 York Rd., Baltimore 12, Md. Own Forces. $420,000. 60 26x30 ft. masonry DWELLINGS, Covan Rd. and Dublin Dr., TOWSON, MD.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **N. C., Edenton**—FUEL STORAGE—B.A. 8/21—Pub. Wks. Office Headquarters, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va., jet aviation fuel storage at the Naval Air Station, Noy 28561, Spec. 30214. Plans deposit $10. CD 4/6/45.

† **Fla., Orlando**—SEWAGE, etc.—B.A. 8/22—U. S. Eng., P. O. Box 4970, Jacksonville, sewage collection and water distr. Pinecastle Air Force Base, Serial No. Eng. 08-123 52-25. CD 1/31.

Tenn., Shelbyville—B.A. 8/22—City, City Hall, Contr. I, sewer lines, manholes, pump lines, replacement of streets, curb and gutter and sidewalks; Contr. II, complete sewage treatment plant, incl. settling basins, trickling filters, sludge drying beds, separate sludge digestion tanks. Plans deposit $50. J. Sanders Parker, 816 8 Ave. S., Nashville, engr. CD 11/13/46.

† **Florida**—B.A. 8/28—U. S. Eng., P. O. Box 4970, Jacksonville, enlarging channel in Intracoastal Waterway, Jacksonville to Miami from 8x100 ft. to 12x125 ft. between Palm Valley and Deer Creek and between Crescent Beach and Flagler Beach Bridge, Duval Co., ENG 08-123-52-6. CD 7/30.

† **La., Alexandria**—B.A. 8/28—Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash., D. C., access road to Warehouse Bldg. 136, approx. 2,200 sq. yd. c. conc. paving, for Veterans Admin. Hospital, Spec. 51173, Proj. 2930.

† **Mississippi**—B.A. 8/30—U. S. Eng., P. O. Box 60, Vicksburg. Hickahala Canal channel improv., Item HC 12.46, Tate Co.; extending along Hickahala Canal for distance of approx. 5.5 mi. beginning point approx. 4 mi. east of Senatobia, CIVENG 22-052-52-10.

BIDS ASKED—BUILDINGS

Ga., Milledgeville—PSYCHIATRIC BLDG.—B.A. 8/21—State Dpt. P. Welfare, State Office Bldg., Atlanta, Ga., 1,000-bed psychiatric bldg. for old people at Georgia State Hospital, approx. $300,000. Gregson & Ellis Mortgage Guarantee Bldg., Atlanta, Ga., engrs. Extended date. CD 7/13.

† **S. C., Fort Jackson**—RECREATING BUILDINGS—B.A. About 8/22—Army Dpt., Custom House, Charleston, patios for 6 recreation bldgs., ENG 38-181-52-4.

Ga., Warner Robins—SCHOOL—B.A. 8/23—Houston Co. Bd. Educ., Perry, Ga., elementary school, $500,000. Plans deposit $50. N. J. Pausculis, Macon, Ga., archt. CD 5/2.

Tenn., Knoxville—DORMITORY—B.A. 8/23—State, Dpt. Institutions, State Office Bldg., Nashville, male dormitory for Eastern State Hospital. Plans deposit $100, Baumann & Baumann, 813½ E. Market St., archts. CD 3/23.

Va., Staunton—JAIL OFFICE—B.A. 8/23—Augusta Co., Staunton county jail and office. Plans deposit $50. J. L. Williams, Darion, archt. CD 2/9.

Tenn., Greenville—ADMINISTRATION, CHAPEL—B.A. 8/28—Holston Methodist Home, c/o Barber & McMurry, archts., 2405 Kingston Pike, Knoxville, administration-chapel bldg. Extended date. CD 7/13.

Tenn., Maryville—SCHOOL—B.A. 8/28—City, Maryville Elementary School, $350,000. Plans deposit $50, Linnsey & Maples, 144 Washington Ave., Knoxville, archts. CD 5/2.

▲ **Ky., Lexington**—HOUSING—B.A. 8/30—Lexington Housing Comn., 600 Blue Grass Park Dr., 397 housing units, Proj. Ky 4-3, $4,500,000. Plans deposit $50, Gillig, Watkins & Wilson, 180 Walnut St., archts. Bids 8/20 rejected. CD 7/24.

La., New Orleans—SCHOOL—B.A. 9/14—Orleans Parish School Bd., 703 Carondelet St., 52,900 sq. ft. student uptown negro elementary school, Sol Rosenthal, 111 Tulane Ave., archt.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

NORTH CAROLINA—State Hy. & P. Wks. Comn., Raleigh, N. C.,

Dickerson Inc., Box 448, Monroe, N. C., LB **$70,097**, structures 9.69 mi. from end of proposed graded road (under construction) approx. 9 mi. east of Lexington, east to beginning of proposed graded road (under construction) approx. 7.5 mi. west of Asheboro. Proj. 5844, S-F-645 (7), Davidson and Randolph Counties. Bids July 31. CD 7/23.

▲ **NORTH CAROLINA**—State Hy. & P. Wks. Comn., Raleigh,

Blythe Bros. Co., 989, Charlotte, N. C., LB **$148,404**, b. conc. 40.39 mi. 25 sections county roads 7-9-61-232, BS 7-7-61-101, Mecklenburg Co; LB **$98,259**, STBD and SA surf. 18.2 mi. 8 sections county roads, 7-9-62-213, 7-9-63-216, Code 5900-704, Richmond and Montgomery Counties; LB **$100,294**, 21 mi. STBC and SA surf. 9 sections of county roads. 7-6-62-214, 7-9-63-217, Richmond and Montgomery Counties; LB **$311,435**, b. conc. binder and surf. 24.65 mi. US 70 and 70A. 10 sections county roads and 2 streets in Morganton. BS 9-6-79-128, Code 5900-938, Burke Co.

Propst Constr. Co., Inc., Box 752, Concord, N. B., LB **$98,438**, bit. or F. A. or b. conc. 28 mi. from Underwoods Store on US 70 to Clayton from US 201 to Coast X-roads via Rehoboth from Carolina Packers on US 301 to Wallace Pl. from Carolina Packers to NC 210 from Selma to Scott Farm via Pittsman X-roads, 49-36-224, 49-36-231, 49-9-V-2303, Johnson Co.; LB **$735,960**, 38.1 mi. 16 sections county roads 4-9-38-219, 4-9-38-220, 4-9-38-221, 4-9-38-223, 4-9-38-224, 4-9-38-225, 4-9-38-227, 4-9-38-241, Wake Co.; LB **$68,286**, STBC and bit. 19.26 mi. 17 sections on County Roads, 7-9-60-220, 7-9-64-227, Cabarrus and Rowan Counties; LB **$91,041**, bit. 28 mi. 15 sections of county roads 7-9-64-228, Rowan Co.; LB **$144,000**, STBC, TBM bit. or b. conc. surf. 13.2 mi. from Lincoln Co. line to Paved Co. road from Crouse to county line thence to Laboratory from co. line to Landers Chapel and Fork from NC 27 at Sanley N. to Co. line 9-9-81-218, 9-9-83-215, Gaston and Lincoln Counties.

Taylor Constr. Co., Asheville, N. C., **$174,489**, grading TBD and bit. 388 mi. NC 194 from Int. of NC 181 and N 194 in Newland S. to Int. with US 221. 0.25 mi. S. of Pineola 8025 S411 (1), Avery Co.; LB **$306,092** b. conc. binder and surf. 23.23 mi. US 29 and 74A, NC 26, US 29 from S. C. State Line to Grover to 36 ft. pavement in Kings Mountain, from point on NC 185 mi. S. of Shelby N. E. and N. through Patterson Springs to point on NC 18 3 mi. N. E. of Shelby US 74 and 74A from wide pavement in Shelby to by-pass Int. previous section of Proj. 1.5 mi. E. of Shelby BS 906-80-142, BS 9-7-80-27, Code 5900-921 Code 5900-926, Code 5900-946, Cleveland Co.

Dickerson, Inc., Box 448, Monroe, N. C., LB **$175,073**, STBC bit. 9.51 mi. from point approx. 0.2 mi. SE of U. S. 301 at Smithfield City limits S. E. to US 70 near Southern Railway Underpass, 4-156, S-558 (2), Johnson Co.; LB **$129,967**, STBC, bit. of SA or b. conc. surf. 11.57 mi. Part 1 from Int. of Two Co. Rds. at Johnson Co. Line approx. 0.2 mi. NE. of NC 222 just N. of Kenly. N. E. approx. 7.5 mi. to point on paved Rd. 0.9 mi. N. W. of Lucama. Part 2, from point on paved co. rd. approx. 0.7 mi. N. W. of Lucama N. E. 4 mi. to Point on US 301 approx 0.5 mi. SW. of Jct. of US 301 and US 117. 4-9-40-26, Wilson Co.; LB **$77,150**, bit. 18.8 mi. Patton Road. Rabbitt Creek Rd., Tessentee Rd., Iotla-Burnington Rd., Phillips Bridge Road, Raburn Bald Road. 19-9-95-202. Macon Co.

Ziegler-Cline Constr. Co., Box 386, Fayetteville, N. C. LB, **$90,288**, b. conc. surf. 17.6 mi. NC 24 and 53, Part 1 from Lockes Creek Bridge in Fayetteville toward Tedman 6.7 mi. NC 24, Parts 2 and 3 from NC 24 E. of Fayetteville to Jct. with Co. Rd. 3 mi. E. of Cedar Creek BS 3-9-141, Cumberland Co.; LB **$86,627**, b. conc. surf. 13.7 mi. from US 421 at Harrells Store to N 11 at Tim City. BS 3-6-31-131, BS 3-6-34-139, Duplin and Sampson Counties; LB **$144,125**, S. A. or b. conc. base and surf. 19.7 mi. from Turnbull Rd. to Old Wilmington Rd. via Troy Fisher Ext. of Chicken Rd. from Cliffdale W. to US 15 A from Cumberland S. W. and N.W. via Diggers X roads to A. & R. R. approx. 1.8 mi. S. of Renix Tom Starling Rd. from US 301 to NC 86, 3-9-30-237, Cumberland Co.

Barrus Constr. Co., Box 561, Kingston, N. C., LB $64,438 S.Al or b.conc. base and surf. 6.6 from Co. Rd. jct. at Haw E. to US 17 approx. 5 mi. S. of Jacksonville and from end of BST pavement near Verona N.W. to Jct. with First Park 2-9-22-219, Onslow Co. LB **$124,310**, BST of F.S. or B.conc. surf. 36.1 mi. 12 sections of County Roads 4-9-36-235, 4-9-39-223, 4-9-39-224, 4-9-39-226, 4-9-39-231, MS 4-4-39, Johnston and Wayne Counties.

Ballenger Paving Co., Box 1, Mooresville, N. C., LB **$162,516**, S.A. or b.conc. surf. 31.25 mi. 10 sections on county roads, 3-9-34-240, Samoson Co.; LB **$298,450** b.conc. binder and surf. 25.2 mi. US 21 NC 150 US 21 from Mooresville city limit to Mecklenburg Co. line US 21 from Mooresville city limit to 3 Creek Bridge NC 150 from Mooresville city limit to Catawba River Bridge NC 150 from Mocresville city limit to curb and gutter section BS 9-6-82-125, Code 5900-937, Iredell Co.

W. E. Graham & Sons, Cleveland, N. C., LB **$167,516**, Part 2, 6.15 mi. grading, TBM and bit. 6.15 mi. from point of US 321 approx. 1t mi. N.W. of Lenoir to Blowing Rock near Caldwell-Watauga Co. Line, from end of pavement of US 321 aporox. 2.2 mi. N.E. of Caldwell Watauga Co. Line at Blowing Rock toward Boone approx. 1.27 mi. 7197, F-432 (5), F-437 (4), Caldwell and Watauga Counties; LB **$144,971**, TBM or PCSBC and bit. 14.6 mi. from US 601 in Dobson, E. to Paved County Rd. 2 mi. no. of Levelcross, from NC 268, 2.2 mi. E. of Levelcross, S.E. 4.4 mi. from County Rd. at Shoals School E. to Stikes Co. Line, 8-9-73-216, 8-9-73-221, 8-9-73-222, Surry Co.

J. C. Critcher, North Wilkesboro, N. C., LB **$284,660**, grading 9.69 mi. from point approx. 0.2 mi. S.E. of US 301 at Smithfield city limits, S.E. to US 70 near Southern Railway Underpass, 4-156, S-588 (2), Johnston Co.

B. G. Young & Sons, Johnson City, Tenn., LB **$99,944**, grading TBM and bit. 1.66 mi. from point on Blue Ridge Parkway approx. 270 ft. s. of it Int. with NC 181 N to point 0.22 mi. S of US 221 at Pineola, 8025 S-329 (1).

Macon Constr. Co., Franklin, NC., LB **316,309**, grading, TBM, bit. 14.24 mi. from point approx. 6 mi. S. of Int. of US 70 and 25 with NC 209 in Hot Springs S.W. toward Waynesville to Haywood Co. Line in Betsey's Gap 9775 S-391 (10), Madison Co.

Edison Constr. Co., Mocksville, N. C. LB **$114,402**, grading 19.7 mi. 3 sections of county roads 2-9-20-210, Jones Co.

J. F. Cleckley & Co., Box 209, Orangeburg, S. C., LB, **$124,026** SA or b.conc. surf. 24.93 mi. 6 sections county roads 3-9-27-229, Bladen Co.

F. D. Cline Constr. Co., Box 349, Raleigh, N. C., LB. **$101,294** S.A. or b.conc. surf. 21.2 mi. Hunters Hill to Easonburg Westerly No. toward Red Oak, Nashville, N. C. to Griffin Momeyer to White Oak Church. White Oak Church to NC-581, 4-9-37-225, Nash Co.

Asheville Paving Co., Box 7068, Asheville, N. C., LB **$153,133**, b.conc. binder and surf. 10.52 mi. NC 284 from Waynesville to Jct. US 19, US 19, from Delwood to Jackson Co. Line, NC 284 in Waynesville, BS 10-6-92-136, BS 10-6-92-317, Code 5900-1034, Haywood Co.

Kiker & Yount, Inc., Box 330, Reidsville, N. C., LB **$613,150** Part 1, grading TBM and BST 6.15 mi. US 321, 7197 F-432 (5), F-437 (4), Caldwell and Watauga Counties.

J. C. Critcher, North Wilkesboro, N. C., LB, **$284,660** grading 9.69 mi. from end of proposed Grand Road (under construction) approx. 9 m. E. of Lexington E. to beginning of proposed graded road (under construction) approx. 7.5 mi. W. of Asheboro, 5845, S-F-645 (7), Davidson and Randolph Counties. Bids July 31. CD 7/23.

Henry G. Dupree Co., 1125 Kings Ave., Jacksonville, Fla., CA **$397,000**, refueling aircraft bulk storage facilities at Turner Air Force Base, ALBANY, GA. U. S. Eng., P. O. Box 889, Savannah, Ga.

City, Smyrna, Ga., Owner Builds, **$36,000**, extend. water mains, SMYRNA, GA.

Manuel Constr. Co., Jacksonville Beach, Fla., CA **$66,200**, recreation bldg. at Ocean Front Park, JACKSONVILLE BEACH, FLA. City, Jacksonville Beach, Fla. Lee Roy Sheftall, Clark Bldg., Jacksonville, Fla., archt. Awarded July 28.

Ballard County Rural Telephone Co-operative, Paducah, Ky. Owner Builds. **$804,000**. telephone lines in Ballard and McCracken Counties, KENTUCKY.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **Virginia Eng. Co.**, Newport News, Va. CA **$2,451,000**. FIRE CONTROL and GUNNERY INSTRUCTION BLDGS., at Fleet Air Defense Training Center, NOY 28432, DAM NECK, VA. Fifth Dist. Pub. Wks. Office, Norfolk, Va. CD 7/11, under LB.

▲† **Conquest Moncure & Dunn, Inc.**, 208 E. Cary St., Richmond, Va. CA **$2,021,294**, two WAREHOUSES, Richmond Quartermaster Depot, RICHMOND, VA. U. S. Eng., foot of Front St., Norfolk, Va. Bids July 31. CD 7/12.

▲ **Daniel Constr. Co.**, 429 Main St., Greenville, S. C. CA **$7,000,000**. mfg. PLANT for lease to Textron, Inc., ELIZABETHTON, TENN. City, Elizabethton, Tenn. CD 6/11.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Mich., Bay City**—B.A. 8/27—City, George MacPhail, mgr., sewage disposal plant, 10 mi. interceptor sewers, diversion chambers, river crossing, etc. $5,000,000 Francis Eng. Co., 303 Eddy Bldg., Saginaw, engr. CD 6/22.

BIDS ASKED—BUILDINGS

▲ **O., Toledo**—LIBRARY—B.A. 8/21—University of Toledo, Asa S. Knowles, pres., Bancroft St., library and law school bldg. $1,670,000. Plans deposit $25. Bellman, Gillett & Richards, 518 Jefferson St., archts. and engrs. CD 7/24.

Mich., River Rouge—SCHOOL—B.A. 8/23—City, Bd. Educ., 2 story, brick, masonry school addn., Burk, East Pleasant and LeRoy Aves. $300,000. Plans deposit $15, Jensen & Keough, 15875 James Couzens Hy., Detroit, archts. CD 2/19.

O., Columbus—LABORATORY, PILOT PLANT—B.A. 8/24—Dpt. P. Wks., S. O. Linzell, Dir., Ohio Dpts. Bldg., Addendum No. 2, waste treatment laboratory and pilot plant at Ohio State University. Plans deposit $5. H. G. Allen, c/o owner, archt.

O., Toledo—DORMITORIES—B.A. 8/27—University of Toledo, Asa S. Knowles, pres., Bancroft St., dormitories for University of Toledo. $800,000. Plans deposit $5, Peterson, Hoffman & Grow, Spitzer Bldg., Zone 4, archts. and engrs. CD 7/24.

Ill., Chicago—PLANT—Bids Asked—Imperial Smelting Co., 1000 E. 103 St., plant, $100,000. Sidney Fink, 134 N. LaSalle St., Chicago, 2, Ill., archt.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

WISCONSIN—State Hy. Comn., State Office Bldg., Madison.

L. G. Arnold Inc., Eau Claire, Wis., LB **$165,778** structure B 17-5 Spring Valley-Menomonie (Red Cedar River Bridge) Rd. S.T. Hy. 29, Proj. T 082 (5), Contr. 2 Dunn Co.

H. Turner & Son, Boscobel, Wis., LB **$86,619**, Contract 2, structures Cassville-Bloomington Rds., S.T. Hy. 133 Proj. S 0200 (1), Grant Co.

Edward Kraemer & Sons, Plain, Wis., LB **$95,107**, Contract 3, structures, Platteville-Mineral Point Road, U.S. Hy. 151, Proj. F 012-1 (33) and (32), Lafayette and Iowa Counties. Bids July 31. CD 7/12.

▲ **WISCONSIN**—State Hy. Comn., State Hy. Office Bldg., Madison.

W. L. Kimmes Inc., and Wm. L. Kimmes, Superior, Wis., LB **$328,066**, Contract 1, grading, draining, 14.392 mi. The Eagle River-Michigan State Line Road, U. S. Hy. 45, Proj. F 09-2 (18), Vilas Co., LB **$178,936**, Contract 1, grading, draining 10.844 mi. The Luck-East County Line Road, S.T. Hy. 48, Proj. T 0132 (1), Polk Co.

Hoffman Constr. Co., Black River Falls, Wis., LB **$294,309**, Contract 1, grading, draining, structures 8.626 mi. The South County Line-Black River Falls Road, S. T. Hy. 27, Proj. F 07-1 (3), Jackson Co.

P. W. Ryan Sons, Janesville, Wis., LB **$187,136**, Contract 1 grading, draining 5.038 mi. The Cataract-North County Line Road, S.T. Hy. 27, Proj. F 07-1 (4) Monroe Co.

L. B. Arnold, Inc., Eau Claire, Wis., LB **$331,909**, Contract 1, grading, draining 14.695 mi. The Elevaeau Claire Road S.T. Hy. 93, Proj. T 09 (3) and T 090 (4) Trempealeau and Eau Claire Counties.

McLean-Astleford Co., 400 W. 78 St., Minneapolis, Minn., LB **$316,352**, Contract 1, grading, draining 8.006 mi. The West County Line-Connorsville and U. S. H. 63-East County Line Roads, S.T. Hy. 64, Proj. T 059 (3) and T 059 (5) Dunn and St. Croix Counties.

Bacco Constr. Co., Iron Mountain, Mich., LB **$120,029** Contract 1, c.conc. 1,382 mi. The Pembine-Niagara (Village of Niagara) Road, U. S. HY. 141, Proj. T 040-1(7), Marinette Co.

J. W. Craig Co., 1814 N. E. California St., Minneapolis, Minn. LB **$110,015**, Contract 2, single aggregate bit. 8.807 mi. The Misha-Mokwa-North County Line and South County Line Durand Roads, S. T. Hy. 25, Proj. F 046-1(8) and (10) Buffalo and Pepin Counties.

Otto Wiesner Inc., and Otto Wiesner, Superior, Wis., LB **$129,675**, Contract 1, b.conc. 3 mi. The Baldwin-East County Line Road, U. S. Hy. 12, Intermittent construction Proj. T 06-4 (16), St. Croix Co.

Rasmussen Constr. Co., Oshkosh, Wis., LB. **$68,421** Contract 1, b.conc. 1.501 mi. The Weyauwega-Fremont-S.T.H. 110 Road, U. S. Hy. 10, Proj. 019-3(5), Waupaca Co.

Clarence Weiss, La Crosse, Wis., LB, **$93,471**, Contract 1 grav. or crushed stone base course 4.843 mi. The Independence-Whitehall Rd, S.T. Hy. 121, Proj. S 0180 (4), Trempealeau Co. Bids July 31. CD 7/17 and CD 17/19.

BUILDINGS

LOW BIDS AND CONTRACTS

Indiana Eng & Constr. Co. Fort Wayne Bank Bldg., Fort Wayne, Ind., CA, **$150,000**, structural steel, face brick FACTORY Addn., FORT WAYNE, IND. International Harvester Co., 180 N. Michigan Ave, Chicago, Zone 1, Ill. Awarded July 24. CD 7/24.

Wm. C. Kuhlman Co., 732 N. Cicero St., Chicago, 44, Ill., CA, **$450,000**, SCHOOL addn. and CONVENT, CHICAGO, ILL. St. Robert Bellarmine Parish, Austin and Eastwood Sts., Chicago, Ill. Bids July 24, awarded July 27. CD 7/7.

Village Development Co. 8905 E. Prairie St., Skokie, Ill., Owner Builds, **$300,000**, 36-unit row HOUSING, EVANSTON, ILL. Fred Schuricht, 5810 Lincoln Ave., Morton Grove, Ill., archts. Awarded July 25.

Kuhne-Simmons Co., P.O. Box 680, Champaign, Ill., CA, **$980,000**. Housing Proj. Ill. 6-4, URBANA, ILL. Housing Auth. Champaign County, Urbana, Ill. CD 7/23, under LB.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Minn., Brainerd—B.A. 8/21—Crow Wing Co., F. M. Hagberg, aud., grav. base 5 mi. between south county line and SAR 2 at Pine Center, S. P. 18-515-02 (SAR 8), Minn. Proj. S 827 (4), grav. base 3.9 mi. between south county line and T. H. 218 near Nolkaspipi River, S. P. 18-516-02 (SAR 5), Minn. Proj. S 448 (3). Plans deposit $1.10; grav. base 5.5 mi. between CAR 15 and T. H. 18, 1 mi. east of Brainerd, S. P. 18-517-02 (SAR 9), Minn. Proj. S 461 (2). Plans deposit 55c. $90,000. E. S. Rankin, co. hy. engr.

Minn., Rochester—B.A. 8/21—Olmsted Co., Frances L. Underleak, aud., crushed rock surf. 3.6 mi. between Little Valley and North County Line, two concrete box culverts, S. P. 55-508-05 (SAR 10), Minn. Proj. S 685 (7). Plans deposit 90c., crushed rock surf. 3 mi. bewteen west county line and 0.5 mi. west of Genoa,

one concrete box culvert, S. P. 55-518-01 (SAR 14), Minn. Proj. S 817 (1). Plans deposit $1.60. $60,000. G. J. Sullivan, co. hy. engr.

† **Ia., Council Bluffs**—B.A. About 8/22—U. S. Eg., 1709 Jackson St., Omaha, Neb., altering sewer lines adjacent to 29th Avenue Pumping Station, Spec. CIVENG 25-067-52-15.

† **Colorado**—B.A. 8/23—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., supervisory control and telemetering equipment for Granby Pumping Plant, Willow Creek Pumping Plant and Willow Creek Dam, Colorado-Big Thompson Proj., Spec. DS-3476. Extended date, CD 7/3.

Nebraska—RURAL DISTRIBUTION LINES—B.A. 8/23—Midwest Electric Membership Corp., Grant, 54.45 mi. transmission lines, Kieth and Perkins Counties. $150,000. Raymond H. Reed & Co., Columbus, engr. CD 3/30/50.

† **Tex., Amarillo**—STEAM, AIR and CONDENSATE SYS.—B.A. 8/23—U. S. Atomic Energy Comn., Los Alamos, N. M., steam, air and condensate returns, sys., incl. 52,000 lin. ft. pipe work, Pantex Plant, $250,000-$500,000. Plans deposit $50.

† **Texas**—B.A. 8/24—U. S. Eng., 1127 T & P Bldg., Fort Worth, right bank earthwork Dam B. Inv. CIVENG 41-443. 52-11, $100,000. Plans deposit $10. CD 2/11/49.

† **South Dakota**—B.A. 8/27—Fish & Wildlife Service, 1006 W. Lake St., Minneapolis, Minn., reinforced drain lines and water supply at U. S. Fish Cultural Station, near Spearfish.

† **Montana**—B.A. 8/28—Bureau Reclamation, Dpt. Interior, Hungry Horse Government Camp, Columbia Falls, dismantling and moving Wheeler Creek Bridge, Graves Creek Bridge, South Fork River Bridge and Sullivan Creek Bridge from Hungry Horse Reservoir Hungry Horse Proj., 10 to 40 mi. southeast of Columbia Falls, Spec. 100C-134.

† **Tex., Amarillo**—PUBLIC ADDRESS and TELEPHONE CONDUIT—B.A. 8/28—U. S. Atomic Energy Comn., Chief Contract Div., Los Alamos, N. M., public address and telephone conduit, Inv. 291-52-11. $85,000. Plans deposit $50.

† **Wyoming**—TRANSMISSION LINE—B.A. 8/28—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., constr. Seminoe-Bairoil 34.5 kilovolt transmission line, Kendrick Proj. Spec. DC 3501. L. N. McClellan, ch. engr.

▲ **Minn., Albert Lea**—B.A. 8/29—City, W. C. Hyde, mgr., sewage treatment plant, 4,000 ft 24 and 30 in. rein.-con. sanitary sewers. $1,100,000. Extended date. Banister Eng. Co., 1549 University Ave. St. Paul, engr. CD 7/11.

Mo., St. Louis—B.A. 9/4—City, Frank J. McDevitt, pres. Bd. Pub. Service, 304 City Hall, 12 and Market Sts., Zone 3. rein.-con. seawall 1 ft. thick to height 5 ft. above ground level, 700 ft. total length at Howard's Bend Water Works on Missouri River, $73,000. CD 8/14/44.

▲ **Texas**—BAYTOWN TUNNEL—B.A. 9/11—State Hy. Comn., Austin, completing Baytown subaqueous tunnel, Contr. II, two 226 ft. tunnel sections, incl. ventilating bldg., in open cut, two open approach sections each 551 ft. in length; garage and maintenance bldg; crash trunk garage; plumbing and drainage; electrical work, incl. tunnel lighting, mechanical work and tunnel ventilation sys.; ceramic tile and architectural terra cotta throughout entire length of tunnel, niche frames and covers, embankment at north and south ends of project, service roads, etc. Parsons, Brinckeroff, Hall & Macdonald, 51 Broadway, New York, N. Y., consult. engrs. CD 4/6/51.

BIDS ASKED—BUILDINGS

▲ **Tex., Waco**—HOUSING—B.A. 8/30—U. S. Eng., 606 Santa Fe Bldg., Galveston, construct, manage, finance 500 military housing units, Connally Air Force Base, Eng. 41-243-52-10. $4,500,000. Plans deposit $50, CD 7/17.

▲ **Ark., Little Rock**—HOSPITAL—B.A. 9/6—University of Arkansas Medical School, Little Rock, 9 story, bsmnt., hospital, $9,000,000. Plans deposit $100. Extended date. Erhart, Eichenbaum & Rauch, Wallace Bldg., archts. CD 7/3.

▲† **Tex., Amarillo**—BUILDINGS—B.A. 9/18—U. S. Atomic Energy Comn., Los Alamos, N. M., constr., modification of 8 bldgs., total of 71,500 sq. ft. $2,000,000-$4,000,000.

▲† **N. M., Los Alamos**—SHOP—B.A. 10/2—U. S. Atomic Energy Comn., Los Alamos Proj. "L" TA-3, 240x600 ft. mono concrete and concrete block exterior, technical shop incl. clearing grading, paving, site improvs. and utilities Inv. No. 291-52-3. $2,500,000-$3,000,000. (Correction—bid date) CD 6/27.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul.

J. Diesseth Co., Fergus Falls, Minn. CA $687,819. c. conc. base, plant-mixed bit. surf. 5.4 mi. in Grand Rapids and between Grand Rapids and 2.6 mi. east, Itasca Co. CD 7/10. under LB.

City, C. A. Norrbom, clk., received no bids July 27 sanitary sewers in various streets, SIOUX CITY, IA. CD 7/19.

City, C. A. Norrbom, clk., Sioux City, Ia., rejected Bids July 26, administration bldg. at municipal airport, SIOUX CITY, IA. CD 7/18.

City, E. H. Herrig, clk., Wall Lake, Ia., rejected bids July 24, street improvs., WALL LAKE, IA. Will readvertise in 1952. CD 7/18.

† **Massman Constr. Co.**, 20 W. 9 St., Kansas City, Mo. LB $448,625. dikes and revetment at Missouri River, near Corning, Inv. 52-5, MISSOURI, U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids July 31. CD 7/23.

† **Peter Kiewit Sons' Co.**, Omaha National Bank Bldg., Omaha, Neb. LB $436,457. underground utilities sys. at Wichita Air Force Base, KCM 52-3, WICHITA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City, Mo. Bids July 12.

Crosby Water Control & Imprvt. Dist., Crosby, Tex. Purchase and Hire, $40,000. water lines, CROSBY, TEX. M. C. St. John, West Bldg., Houston, Tex., engr.

Crosby Water Control & Imprvt. Dist., Crosby, Tex. Purchase and Hire, $62,500. sanitary sewer lines, CROSBY, TEX. M. C. St. John, West Bldg., Houston, Tex., engr.

Dallas Co. Water Control & Imprvt. Dist. 5, Court House, Dallas, Tex. Owner Builds. $37,500. artesian well; $45,000. c.i. pipe lines, Pleasant Grove area, DALLAS, TEX. CD 9/10/47.

Home Owned Properties, Inc., Scanlan Bldg., Houston, Tex. Purchase and Hire. $38,000. water lines, HOUSTON, TEX.

Home Owned Properties, Inc., Scanlan Bldg., Houston, Tex. Purchase and Hire, $67,000. sanitary sewers; $75,000 storm sewers, open drainage earthwork, HOUSTON, TEX.

Home Owned Properties, Inc., Scanlan Bldg., Houston, Tex. Purchase and Hire. $70,000. street constr., asph. type paving, HOUSTON, TEX.

D. R. Cloud & Son, Transit Tower, San Antonio, Tex. CA $75,000. conc. curbs, gutters, asph. type paving, KENEDY, TEX. City, Kenedy, Tex. L. C. Gilliam, Jones Bldg., Corpus Christi, Tex., engr.

City, Richmond, Tex. Owner Builds. $60,000. sanitary sewers, RICHMOND, TEX.

City, Richmond, Tex. Owner Builds. $35,000. c.i. water lines, RICHMOND, TEX.

Rio Grande City and Starr County Water Control & Imprvt. Dist., Rio Grande City, Tex. Purchase & Hire. $122,500. sanitary sewer lines, RIO GRANDE CITY, TEX. CD 1/11.

Rio Grande City and Starr County Water Control & Imprvt. Dist., Rio Grande City, Tex. Purchase and Hire. $37,000 water distr. lines; $38,000, addnl. WW imprv., exten., RIO GRANDE CITY, TEX. A. J. Vale, dist. engr. CD 1/11.

City, Rusk, Tex. Purchase and Hire. $35,000. water sys., rehabilitation and line extension, RUSK, TEX. Wisenbaker, Fix & Assoc., Tyler, Tex., engrs.

Thomas Bate & Sons, 2311 10 St., Denver, Colo., CA $928,718, est. $1,000,000, constr. Northeast Storm Sewer District, bounded by E. 48 St., E. 12 Ave., Quebec and Ash Sts., DENVER, COLO. City and Denver Co., City and County Bldg., Denver, Colo. Bids July 24, awarded July 26. CD 6/30.

▲† **Dpt. Navy, Buckley Field** Naval Air Station, Denver, Colo., rejected bids June 27, rein.-con. shell-arch type, Naval Air Station Reserve Training Hangar leantos, adjacent apron extension, sidewalk and paved areas, Spec. 29458, Buckley Field, DENVER, COLO. LB. $1,716,000. Bids June 27. CD 7/17, under LB.

▲ **New Mexico**—State Hy. Dpt., Capitol Bldg., Santa Fe, N. M.

Henry Thygesen & Co., 424 E. McKinley Ave., Albuquerque, N. M., CA $95,596, Shiprock-Gallup, State Proj. FAP 147 (4); CA $84,145, Carrizo-San Antonio, State Proj. FAS 126 (3); CA $68,906, Cuba-Bernalillo and Jemez Springs-Sa San Ysidro State Proj. FAP 185 and FAP 234.

W. T. Bookout Constr. Co., Las Vegas, N. M., CA $509,510 Silver City-Lordsburg Proj. Nos. F-168 (6) and (7); CA $168,666, Mora-Las Vegas, State Proj. FAP 32 and 33.

Jack Adams, 106 E. Balboa St., Santa Fe., N. M., CA $224,443 Chama-New Mexico-Colorado State Line, Proj. F-182 (5).

Wheeler & Trotz, Albuquerque, N. M., CA $235,821 Clayton-Nara Visa, Proj. S-167 (3). Grand total $1,387,087. Bids July 27.

BUILDINGS

LOW BIDS AND CONTRACTS

Sam Wolff & Co., 3837 W. Pine Blvd., St. Louis 8, Mo. 1 story, 30x17 ft., brick, concrete printing PLANT addn., 2813 Locust St., ST. LOUIS, MO. Wm. and Louise Beckman Trust Estate, 606 S. 7 St., St. Louis 2, Mo. Cay G. Weinel, 3837 W. Pine Blvd., St. Louis 8, Mo. archt.

▲ **Babcock & Wilcox**, Shell Bldg., St. Louis, Mo. CA $1,136,018. POWER PLANT BOILER for Kaw River Station, KANSAS CITY, KAN. Bd. Pub. Utilities, City Hall, Kansas City, Kan. Burns & McDonnell Eng. Co., 95 and Troost Sts., Kansas City, Mo., engr. CD 1/12.

▲ **D. C. Bass & Son**, Enid, Okla., CA $1,970,289, general constr. West High SCHOOL; **Ripstra-Turner Co.**, 1015 E. Douglas St., Wichita, Kan., CA, $485,908, plumbing, heating and ventilating for above school, WICHITA, KAN. Bd. Educ., Wichita, Kan. Bids July 23. CD 7/10.

Thos. M. Ryan & Co., 801 Commerce St., Fort Worth, Tex. Owner Builds. $325,000. SHOPPING CENTER UNITS, FORT WORTH, TEX. CD 4/3.

Home Owned Properties, Inc., Scanlan Bldg., Houston, Tex. Force Account. $325,000. 45 HOUSING units, HOUSTON, TEX.

S. M. Adams & Assocs., 4001 Westheimer St., Houston, Tex. Owner Builds. $325,000. SHOPPING CENTER unit, HOUSTON, TEX. CD 2/21.

S. M. Adams & Assoc., 4001 Westheimer St., Houston, Tex. Owner Builds. $300,000. 18 addnl. DWELLINGS, various locations, HOUSTON, TEX. CD 3/21.

Platt Rogers, Inc., 1530 W. 13 St., Denver, Colo. CA $532,241, general constr. two 1 story, brick, 26,000 sq. ft. grade SCHOOLS, AURORA, COLO. Bd. Educ., School Dist., No. 28-J, Consolidated Dist. of Adams and Arapahoe Counties, 9735 E. Colfax Ave., Denver, Colo. Bids July 20, awarded July 25, CD 5/24.

FAR WEST

BIDS ASKED—BUILDINGS

Calif., San Jose—SCHOOL—B.A. 8/21—Alum Rock Union Elementary School Dist., 149 McCreery Ave., school near here, $500,000. Plans deposit $50. Kress & Gibson, 525 First Natl. Bank Bldg., San Jose, archts. CD 1/16.

Ariz., Tempe—PHYSICAL EDUCATION—B.A. 8/22—State, Arizona State College, Tempe, 205x296 ft., masonry physical education bldg., Arizona State College, $925,000 Kemper Goodwin, Tempe, archt. CD 3/27.

▲† **Wash., Richland**—RADIOMETALLURGY—B.A. 9/5—Atomic Energy Comn. for operation of Hanford Works, 21,000 sq. ft. radio metallurgy bldg. at Hanford Works, $1,000,000. Plans deposit $50. CD 4/2.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Teller Constr. Co.**, Builders Exchange Bldg., Portland, Ore., CA $636,230, fish hatchery on Little White Salmon River, WILLARD, WASH. Dpt. Interior, Fish & Wildlife Service, Swan Island, Portland, Ore. Bids June 27. CD 7/6, under LB.

▲† **Consolidated Builders, Inc.**, Mill City, Ore. CA $7,252,947. constr. Big Cliff Dam, complete Detroit Dam power house, North Santiam River, Marion Co., OREGON. U. S. Eng., Pittock Block, Portland, Ore. Awarded Aug. 1. CD 7/27 under LB.

▲† **Chicago Bridge & Iron Co.**, 200 Bush St., San Francisco, Calif. CA $2,590,205. steel shell and support structures for supersonic wind tunnel at Moffett Field, MOFFETT FIELD, CALIF. National Advisory Com., for Aeronautics, Ames Aeronautical Laboratory, Moffett Field, Calif. Awarded Aug. 2. CD 7/24, under LB.

† **Fredericksen & Kasler**, 212 13 St., Sacramento, Calif., CA; $616,357, runway, taxiway extensions, etc. at Oxnard Air Force Base, ENG 51-87, OXNARD, CALIF. U. S. Eng. 751 Si Figueroa St., Los Angeles, Calif. Bids June 18, awarded July 30. CD 6/26, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

† **J. A. McNeil Co.**, 741 West Olympic Blvd., Los Angeles, Calif. LB, $804,000, TEST BLDGS. and facilities Ballistics Ground Ranges, NOY 28387, Spec. 30041, INYOKERN, CALIF. Officer in Charge of Construction, Ordnance Test Station, Inyokern, Calif. Bids July 19. CD 6/6.

▲ **James I. Barnes Constr. Co.**, Kansas St., San Francisco, Calif., LB, $1,750,000. HOSPITAL-ADMIN. bldg., EMPLOYEES'S HOUSING, GARAGE, SCHOOLS, Institution for Epileptics, PORTERVILLE, CALIF. CD 7/6.

Mills Constr. Co., 405 Montgomery St., San Francisco, Calif. $750,000. CA. INDUSTRIAL BLDG., Bay Rd. and Douglas St., REDWOOD CITY, CALIF. Bemiss-Jasen Co., 111 Townsend St., San Francisco, Calif. Bruce Heiser, 821 Market St., San Francisco, Calif., archt. Awarded Aug. 3.

The Pacific Co., 801 Cedar St., Berkeley, Calif. CA $784,000, HIGH SCHOOL, VACAVILLE, CALIF. Vacaville Union High School, Vacaville, Calif. Bids June 13, awarded July 23. CD 6/21, under LB.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

† **Alaska, Seldovia**—B.A. 9/6—Alaska P. Wks., Dpt. Interior, Juneau, dam, pipe line and chlorination system, Proj. 50-A-68, $89,950. Plans deposit $15. F. J. Toner, Juneau, engr.

CANADA

BUILDINGS

LOW BIDS AND CONTRACTS

Lagace Constr. Ltd., 130 Blvd. Labelle St., L'Aboard-A-Plouffe, Que., CA, $88,600, collector sewer, Ward Ave., LASALLE. (Postal Dist. Montreal), QUE. Municipality, La Salle, Que. A. Latour, Town Hall, town engr.

BUILDINGS

LOW BIDS AND CONTRACTS

Dunker Constr. Ltd., 251 King St. W. Kitchener, Ont., CA, $300,000. 1 story, 75x300 ft., steel frame tube-bending SHOP, GALT, ONT. Babcock-Wilco & Goldie McCulloch Ltd., 64 Grand St., Galt, Ont. CD 8/9/50.

Foundation Co. of Ontario Ltd., 1220 Bay St., Toronto, Ont. CA $700,000. 2-story, 140x302 ft., rein.-con., brick high SCHOOL, LEAMINGTON, ONT. Leamington High School Bd., Leamington, Ont. S. B. Coon & Son, 41 St. Thomas St., Toronto, Ont., archts. Bids July 11, awarded July 31. CD 7/2.

D'Amours & Brother Ltd., 2633 Bourbonniere Ave., Montreal, Que., CA, $350,000, SCHOOL, GRANBY, QUE., School Comn., Granby, Que. Bids July 25.

M. Cauchon Ltd., 311 Lasalle St., Quebec City, Que., CA central HEATING PLANT at Quebec Citadel, QUEBEC CITY, QUE. Govt. of Canada, Dpt. National Defence ARMY, Cartier Sq. Ottawa, Ont. Bids May 22. CD 5/9.

Heroux & Robert Ltee, 1414 Crescent St., Montreal, Que., LB, Approx. $500,000. 62x84 ft., rein.-con. CHURCH and PRESBYTERY, ST. LAURENT, QUE. Parish of Ste. Sixte, Rev. L. Lacombe, cure, St. Laurent, Que. CD 10/4.

AMERICANS ABROAD

BIDS ASKED—HEAVY CONSTRUCTION

† **Bermuda**—B.A. 8/29—U. S. Eng., 80 Lafayette St., New York, 13, N. Y., airfield facilities, Kindley Air Force Base, Fort Bell. Plans deposit $20. CD 7/26, under LB.

PROPOSED PROJECTS

WATER SUPPLY

Kan., Pittsburg—City, $905,000 bond election Sept. 18, remodel pumping station, water storage tanks. CD 9/1/50.

La., Jonesboro—City, c/o city clk., bond election Aug. 28, WW imprvs., $100,000.

▲ **Miss., Gulfport**—City, $2,500,000 bond election Aug. 7, WW imprvs. CD 9/2/48.

Tex., Baytown—City, cancelled bond electon Sept. 22, WW, $400,000; WW rehabilitation, $125,000. George M. Hillyer, city engr. CD 7/13.

SEWERS, WASTE DISPOSAL

▲ **Ill., Chicago**—City, City Hall, Zone 2, Central South Side Sewerage System, Greenwood, Dobson and Ellis Aves. $1,000,000. CD 2/8.

Kan., Olathe—Johnson County Sewer Dist. 1, voted $796,040 bonds July 26, sewage treatment plant and pumping facilities, 16 in. force main from dist. pumping station now at State Park Dr. and Belinder Ave. to treatment plant at 47 and Nall Aves., and on new treatment plant adjacent to present one. Black & Veatch, 4706 Broadway, Kansas City 2, Mo., consult. engrs. CD 7/9.

Kan., Pittsburg—City, $838,000 bond election Sept. 18, sewage plant. CD 9/1/50.

Mo., Florissant—City, Henry H. Koch, city clk., City Hall, 619 Francois St., voted $175,000 bonds, sewer sys. imprvs. incl. trunk relief sewers; sewage disposal facilities, $125,000. Horner & Shifrin, Shell Bldg., 1221 Locust St., St. Louis 3, Mo., consult. engrs.

▲ **Mo., University City** (St. Louis 5, P. O.)—City, c/o City Council, open channel storm sewer in River des Peres through city, $3 375,000. Horner & Shifrin, Shell Bldg., 1221 Locust St., St. Louis, Zone 3, consult. engrs. CD 3/5.

Pa., New Castle—Universal Rundle Corp., New Castle industrial waste plant, $100,000. Consoer, Townsend & Assoc 351 E. Ohio St., Chicago, Ill., engrs.

Pa., Sharon—City, defeated $250,000 bonds, garbage incinerator. CD 4/25.

Tex., Baytown—City, Baytown, cancelled bond election Sept. 22, sanitary sewer lines, $350,000; storm sewers, $500,000; sewer disposal plant, $130,000. George M. Hillyer, city engr. CD 7/16.

▲ **Tex., Houston**—City, Oscar Holcombe, mayor, sanitary sewerage sys., consists of vast sewerage sys., sewage treatment plant, in Harris Co. to alleviate pollution and consolidated independent sys. into one plant and sys., will incl. 150 mi. sewer line, $40,000,000. Frank J. Metyko, Scanlan Bldg., consult. engr. D. Fugate, city engr. J. M. Nagle, dir. Pub. Wks.

▲ **Tex., San Antonio**—City, Jack White, mayor, will not call bond election Sept. 11, storm sewers, $3,-500,000; sanitary sewer lines, $3 000,000; addnl. disposal plant, $800,000; sewage disposal plant, $700,000. New date will be set later. Tom Coghill, city engr. CD 7/24.

Wash., Monroe—City, City Hall, sewerage system and disposal plant, $113,881. Carey & Kramer, 1917 1 Ave., Seattle, Wash., engrs.

Wash., Tenino—City, City Hall, bond election Aug. 28 sewerage system and disposal plant, $155,987 A. K. Skillman, Olympia, consult. engr. CD 10/10/50.

W. Va., Buckhannon—City, City Hall, 1 story bmnt., 30x30 ft., brick, block sewage disposal, primary secondary tanks, filter bed, piping, etc., $500,000. J. Milam, Dunbar, W. Va., engr. CD 8/11/50.

Sask., Regina—City, Regina, incinerator, $500,000. Greeley & Hansen, 220 S. State St., Chicago, Ill., engrs.

BRIDGES

† **California**—Contra Costa Co., Martinez and Solano Co., Fairfield, bridge from Martinez to Benicia across straits of San Francisco Bay $23,000,000. Ralph A. Tudor, 681 Market St., San Francisco, bridge engr.

Kan. Pittsburg—City, $184,000 bond election Sept. 18, overpass over Kansas City Southern R. R. tracks.

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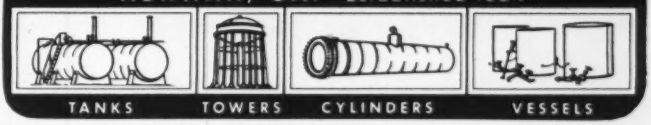

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Neb., Beatrice—Gage Co., Beatrice, bridges, $200,000.
Neb., York—York Co., York, bridges, $150,000.

STREETS AND ROADS

† Idaho—U. S. Forest Service Federal Bldg., Missoula, Mont.

Avery—road construction in St. Joe National Forest, $240,000. P. D. Hanson, regional forester.

MAINE—State Hy. Comn., State House, Augusta, Brooks and Waldo, hy. bit. grav. surf. 3.934 mi., Proj. S 0217 (1).

Mo., Independence—City, voted $175,000 bonds street imprvs., welding and exten. Truman Rd. CD 1/10/45.

N. Y., Arkwright—Town, 20 mi. roads, $140,000.
N. Y., Ashford—Town, 28.8 mi. roads, $108,000.
N. Y., Busti—Town, 50 mi. roads, $356,350.
N. Y., Carroll—Town, 21.2 mi. roads, $139,300.
N. Y., Charlotte—Town, 21.6 mi. roads, $129,100.
N. Y., Chautauqua—Town, 28.4 mi. roads, $202,100.
N. Y., Clymer—Town, 18.5 mi. roads, $116,700.
N. Y., Cortlandville—Town, 30.7 mi. roads, $223,200.
N. Y., Dayton—Town, 17.6 mi. roads, $112,500.
N. Y., Ellery—Town, 22.6 mi. roads, $145,500.
N. Y., Ellicott—Town, 22.48 mi. roads, $145,000.
N. Y., Ellicottville—Town, 19.8 mi. roads, $123,300.
N. Y., Ellington—Town, 21.55 mi. roads, $150,450.
N. Y., Freedom—Town, 25 mi. roads, $141,549.
N. Y., French Creek—Town, 20 mi. roads, $130,000.
N. Y., Hanover—Town, 27.9 mi. roads, $185,850.
N. Y., Harmony—Town, 20.3 mi. roads, $137,160.
N. Y., Hartland—Town, 19.3 mi. roads, $230,100.
N. Y., Himsdale—Town, 25.2 mi. roads, $126,000.
N. Y., Homer—Town, 21.9 mi. roads, $130,700.
N. Y., Leon—Town, 25.7 mi. roads, $115,200.
N. Y., Lockport—Town, 12 mi. roads, $144,175.
N. Y., Machias—Town, 20.1 mi. roads, $112,300.
N. Y., Mina—Town, 15.2 mi. roads, $106,400.
N. Y., Napoli—Town, 20.3 mi. roads, $113,300.
N. Y., Newfane—Town, 19.75 mi. roads, $170,165.
N. Y., North Harmony—Town, 30 mi. roads, $204,100.
N. Y., Otto—Town, 23.7 mi. roads, $126,400.
N. Y., Portsville—Town, 28.5 mi. roads, $122,760.
N. Y., Ripley—Town, 14.3 mi. roads, $102,200.
N. Y., Royalton—Town, 23.95 mi. roads, $245,585.
N. Y., Vinnenova—Town, 15.7 mi. roads, $106,100.
N. Y., Yorkshire—Town, 22 mi. roads, $113,540.
N. Y., Poland—Town, 25.55 mi. roads, $175,350.
N. Y., Pomfret—Town, 22.1 mi. roads, $145,900.
N. Y., Sheridan—Town, 21.1 mi. roads, $139,200.
N. Y., Somerset—Town, 13.95 mi. roads, $149,840.
N. Y., Stockton—Town, 15 mi. roads, $100,000.
N. Y., Westfield—Town, 15.7 mi. roads, $113,600.
N. Y., Wilson—Town, 28.55 mi. roads, $185,320.

▲ Oklahoma—State Hy. Dpt., Capitol, Oklahoma City, Zone 5.
Rogers Co.—17 mi. 4-lane hy. on U.S. 66 from Tulsa Co. line to Clairmore, $3,000,000, G. H. Bittle, c/o owner, engr.

▲ Tex., San Antonio—City Jack White, mayor, City Hall, Military Plaza, will not call bond election Sept. 11, street extens. and new streets, $2,500,000; street rehabilitation, $4,000,000, street paving all over city, $5,000,000. New date will be set later. Tom Coghill, city engr. CD 7/30.

Tex., Alice—Jim Wells Co., Court House, repairing preservation existing farm to market roads, in Premont, $100,000; repairing, preserving existing farm to market roads also 15 blocks street surf., in Sandia, $110,000; repairing, preserving existing farm to market roads in some street imprvs., in San Diego, $80,000; repairing, preserving existing farm to market roads $150,000; repairing, preserving some of existing streets inside city limits, $75,000 both in Alice; repairing, preserving existing farm to market roads incl. some street imprvs., in Orange Grove, $75,000. W. W. Coym, Alice, consult. engr. CD 6/16/47.

Tex., Baytown—City, cancelled bond election Sept. 22, street imprvs. and paving, $500,000. George M. Hillyer, city engr. CD 7/13.

Tex., Eagle Lake—City, 9 mi. inverted penetration type b. conc. street pavement, $298,739. Freese, Nichols & Turner, 2111 National Standard Bldg., Houston consult. engrs. CD 5/22.

▲ Tex., Fort Worth—City, City Hall, bond election September 11, street extens, $3,250,000; street wid'n. program, $2,720,000; street paving, $4,850,000. C. M. Thelin, Dir. Pub. Wks. Eng. CD 10/11/45.

Tex., Houston—Harris Co., Court House, c/o Prec. 2, 17 mi. resurf. Settegast and Oaks Rds. $150,000, resurf. 7 mi. Uvalde Rd., $65,000. CD 3/16.

▲ WASHINGTON—State Hy. Dpt., Olympia.
Clark Co.—limited access highway from Vancouver to Camas, $8,000,000. W. A. Bugge, state hy. dir.

Wash., Ephrata—City, City Hall, curbs, gutters, paving and storm sewers, $300,000. Parker, Hill & Ingman, Smith Tower, Seattle 4, Wash. consult. engrs.

EARTHWORK, WATERWAYS

Ill., Canton—City and Fulton Co., Canton, repairs to Lake Canton spillway and installing addnl. equipment at water treatment plant, $250,000.

Tex., Houston—City, Oscar Holcombe, mayor, C. Fitzgerald, city councilman, Buffalo Bayou imprv., incl. clearing drainage, $100,000; flood control on Buffalo Bayou, consists removing structures, wid'n. straightening, $100,000, L. Fugate, city engr.

AIRPORTS

Mich., Saginaw—ADMINISTRATION BLDG.—City, Tri-City Airport Comn., 2 story, part bsmnt., masonry admin. bldg., Tri-City Airport. $175,000, L. C. Andrews, ch. engr.

▲ Tex., Lackland Air Base (Br. San Antonio)—PROCESSING BLDG.—U. S. Eng., 606 Santa Fe Bldg., Galveston, enlistee processing bldg. $1,000,000. Marvin Eichenroht, Maverick Bldg., San Antonio, consult. engr. CD 5/2.

▲ Tex., Laredo—AIRPORT—City, Hugh S. Cluck, mayor, airport, $8,577,000. CD 1/18/45.

▲† Wash., Tacoma—AIRFIELD PAVEMENTS, etc.—Dpt. Army, Pentagon Bldg., Wash. 25, D. C., airfield pavements, fuel storage and dispensing, operational, troop, administrative and supporting facilities at McChord Air Force Base, $8,797,000. CD 3/24/50.

LATIN AMERICA

Mexico, Mexico City—Industrias Joske's S. A. Argentia, 111-514 Mexico City, plans gold-silver bracelet factory, $250,000.

Mexico, Mexico City—Sanitorios Procesa S. A., 20 de Noviembre, 82-105 Mexico City, plans porcelane furniture factory, $300,000.

Mexico, Mexico City—Tapetesy Alfombras, S. A. Tacuba, 37-207 Mexico City, plans rug-carpet factory, $250,000.

Mexico, Torreon—National Railways of Mexico, Bolivar, 19 Mexico City, plans passenger-freight station, $750,000.

▲ Mexico, Vera Cruz—Direction General de Pensiones (Pensions Department), Mexico City, plans 100-room hotel for Government employees, $1,000,000.

PUBLIC BUILDINGS

Calif., Del Paso Heights—SCHOOL—Robla Elementary School Dist., 5248 Robla Ave., School, $647,500.

Calif., Salinas — HOSPITAL — Salinas Valley Memorial Hospital Dist., Salinas, bond election Sept. 18 hospital at Romie Lane and Wilgart, $500,000.

▲ Calif., San Mateo—SCHOOLS—San Mateo City Elementary School Dist., San Mateo, plans by Falk & Booth, 9 Main St., Francisco, College Park School $470,000; South Shoreview School $600,000, San Mateo Knolls School, $420,000; Meadow Heights School, $415,000. CD 7/9.

Fla., Bartow—HOSPITAL ADDN.—Polk Co., Bartow, plans by W. B. & Thomas V. Taley, Lakeland, Fla., hospital addn., $420,000. CD 4/25, under LB.

Fla., Winter Park—HOSPITAL—Winter Park Memorial Hospital, Winter Park, plans by Francis H. Emerson, Jas. Gamble Rogers II, Geo. H. Spohn and John T. Watson, Associated Architects, Winter Park, hospital $500,000.

Ia., Algona—COURT HOUSE—Kossuth Co., Algona, plans by Dougher, Rich & Woodburn, 302 Garver Bldg., Des Moines, court house, $500,999. CD 9/18/47.

▲ Kan., Kansas City—HOUSING—Kansas City Housing Auth., 414 E. 12 St., Kansas City, Kan., residential development, $1,200,000.

La., Rayne—SCHOOL—Town, plans by Favrot, Reed, Mathes & Bergman, 402 Nola Bldg., New Orleans, 1 story brick, 37,000 sq. ft. school-gymnasium, $450,000.

Me., Bar Harbor—SCHOOL—Town, Bd. Selectmen, 2 story concrete, brick consolidated elementary school, $700,000.

Md., Frederick—SCHOOL—Frederick Co. School Bd., E. Church St., plans by Finney, Wolcott & Assoc., 320 W. 24 St., Baltimore, 1 story, 58x226 ft. and 164x263 ft., brick, concrete, steel North Frederick Elementary School, $500,000, Henry Lee Dodson, 320 W. 24 St., Baltimore, mech. engr., Frank Farm Jr., 3006 Iona Terrace, Baltimore, struct. engr.

Mass., Billerica—SCHOOL—Town, School Bldg., Comn., plans by Thomas Hixon Co., 1150 Commonwealth Ave., Boston, Mass., school, Bellerica Center, $800,000. CD 7/24.

Mass., Lowell—INSTITUTE—Commonwealth of Mass., Dpt. Educ., 200 Newberry St., Boston, plans by Krokyn & Browne, 184 Boylston St., Boston, auditorium, admin. bldg., Lowell Textile Institute, $600,000.

Mass., Taunton—SCHOOL—City, Pub. School Dpt., H. H. Galligan, supt., brick, steel, concrete school adjacent to West Side Playground, $480,000. CD 7/19.

▲† Mich., Battle Creek—BASIC TRAINING BUILDINGS—U. S. Eng., 2015 Cadillac Tower, Detroit, basic training with rifle ranges, offices, admin. bldg., mess hall, engineer shops, quartermaster clothing depot bldg. $4,950,000.

Mich., Carleton—SCHOOL—Bd. Educ. Community School Dist., plans by Frederick D. Madison, 230 S. Main St., Royal Oak, 2 story, 215x225 ft., brick, steel, concrete high school, $800,000.

▲ Mich., Grand Rapids—SCHOOLS—City, Bd. Educ., plans by Louis C. Kingscott & Assoc., 511 Monroe

St., Kalamazoo, and Warren S. Holmes Co., 2200 Olds Tower, Lansing, school program for 13 schools, $5,000,000.

▲ **Mich., Jackson**—SCHOOL—City, Bd. Educ., plans by Carl C. Kressbach, 408 Wildwood St., 2 story, bsmnt., brick, steel, concrete Cascades Intermediate School, $2,000,000.

▲ **Mich., Saginaw**—HOSPITAL—Saginaw Co. Hospital Bd. Trustees, plans by Frederick E. Wigen, 507 Weichmann Bldg., 1 and 3 story, brick, masonry tuberculosis hospital. $1,000,000. CD 1/12.

Minn., St. James—SCHOOL—Bd. Educ., E. C. Fogarty, clk., voted authorization of $565,000 bond issue, school, H. H. Swansen, 500 Sexton Bldg., Minneapolis, archt. CD 7/18.

▲ **N. J., Newark**—HOSPITAL EXPANSION—Newark City Comn., City Hall, expansion and rehabilitation of city hospital, $10,000,000.

N. Y., New York—LECTURE HALL—Metropolitan Museum of Art 5 Ave. and 82 St., plans by Voorhees, Walker, Foley & Smith, 101 Park Ave., Zone 17, Grace Rainey Rodgers lecture hall alterations into radio and television facilities, $820,000.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 63 Park Row, Zone 7, plans by Leon R. Levy, 331 Madison Ave., Zone 17, superstructure for housing project 28 seven story bldgs. in blocks bounded by Middletown Rd., Kennelworth Pl., Rosedale Ave., Bruckner Blvd., Soundview Ave., Watson and Beach Aves., Proj.: NY5-22, Bronxdale Houses. $14,000,000.

O., Lisbon—JAIL—Comrs. Columbiana Co. Court House, bond election Nov. 6, county jail, receiving house for foster children, hospital and court house annex. $750,000 CD 9/19/50.

O., Mansfield—COURT HOUSE—Comrs. Richland Co., Court House, bond election Nov. 6, renovate court house. $500,000.

▲† **O., Rossford**—WAREHOUSE—U. S. Eng., Madison Ave., and Eighth St., W., Huntington, W. Va., plans by Bellman, Gillett C Richards, 518 Jefferson St., Toledo, 3 large warehouse, 1 story 200x1,000 ft. flammable storage bldg., 100,000 sq. yds. hard standing storage area at Rossford Ordnance Depot. $6,000,000-$7,000,000. CD 7/23.

Pa., Bethel—SCHOOL—Municipal Auth. of Bethel, Bethel, plans by C. M. Stotz & Edw. Stotz, 801 Bessemer Bldg., Pittsburgh, 2 story, 80x175 ft., brick, tile Senior High School, $825,000. CD 9/11/47, under Bethel Twp., Pa.

Tex., Fort Worth—POLICE STATION, JAIL—City, City Hall, bond election September 11, police station and jail. $500,000. C. M. Thelin, Dir. Pub. Wks. Engr. CD 10/11/45.

▲† **Tex., Wichita Falls**—ACADEMIC—U. S. Eng., Box 61, Tulsa 2, Okla., plans by Jesse G. Dixon, Box 1799, 3 story 166,000 sq. ft., concrete frame, concrete blocks academic bldg., hot water heating sys., air-conditioning. $1,850,000. Joe E. Ward, 545 Nacol Bldg., consult. engr.

Utah, Tooele—HOSPITAL—Tooele Co., c/o David Bankhead, clk., Tooele, plans by Fetzer & Fetzer, Zions Saving Bank Bldg., Salt Lake City, county hospital, $529,000. CD 6/5.

Vt., Bennington—HIGH SCHOOL—City, School Dpt., Bennington, plans by Alonzo J. Harriman, Inc., 292 Court St., Auburn, Me., high school. $875,000.

Wash., Kennewick—SCHOOLS—School Bd., Kennewick, plans by E. W. Morrison, 719 Second Ave., Bldg., Seattle, Wash., 2 elementary schools, $550,000. CD 2/26.

▲† **Wash., Tacoma**—HOUSING, etc.—Dpt. Army, Pentagon Bldg., Wash. 25, D. C., troop housing, and training facilities at Fort Lewis, $36,916,200.

▲† **Wash., Tacoma**—HOUSING—Dpt. Army, Pentagon Bldg., Wash., 25, D. C., troop housing at Madigan Army hospital $1,875,000. CD 1/15.

▲† **Wash., Tacoma**—Dpt. Army, Pentagon Bldg., Wash., D. C., storage, supporting facilities and utilities at Mt. Rainier Ordnance Depot, $4,485,200.

▲ **Wis., Wauwatosa**—CENTRAL HEATING, and POWER PLANT.—Milwaukee County Institution & Depts., Wauwatosa, central heating and power plant, Approx. $4,000,000. Pfeifer & Schultz, 701 Wesley Temple Bldg., Minneapolis, Minn., consult. engrs.

▲ **Ont., Toronto**—SCHOOL—Etobicoke Bd. Educ., Montgomery Rd., Islington, Toronto 18, Ont., plans by John B. Parkin Assocs., 717 Church St., high school, Royal York Rd., $935,000; plans by Gordon S. Adamson, 960 Yonge St., school, Norseman Rd., $440,000. CD 12/15/43.

Que., St. Hyacinthe—VETERINARY SCHOOL—Dpt. Agriculture Quebec City, Que., (Prov. Govt.) plans by R. Blanchet, 53 d'Auteuil St., Quebec City, veterinary school, Approx. $850,000. CD 3/16.

COMMERCIAL BUILDINGS

Ala., Decatur—HOTEL—Robert T. Harris, Decatur, hotel, $500,000.

Calif., Mountain View—SHOPPING CENTER—Wm. Blackfield Meadow Developing Co., Mountain View, shopping center, El Monte Ave. $415,000.

▲ **Calif., San Francisco**—HOUSING—U. S. Eng., 180 New Montgomery St., San Francisco, plans by Angus McSweeney, 514 Mission St., San Francisco, 500 housing units (133 for Navy and 367 for Army) at Presidio of San Francisco. CD 2/14.

▲ **D. C., Wash.**—HOSPITAL, etc.—National Hospital Foundation Inc., Rev. Amos H. Carnegie, pres. c/o Isadore, Rosenfield, archt., 23 W. 47 St., New York, N. Y., 200-bed interracial hospital and nurses home, E. Capitol St. and Texas Ave. $4,000,000.

Fla., Fort Lauderdale—SCHOOL—Catholic Diocese of St. Augustine, 901 2 St., plans by Barry & Kay 53 W. Jackson St., Chicago, 4, Ill., high school, $500,000.

▲ **Ind., Fort Wayne**—HOSPITAL—Lutheran Hospital Bd. Control, H. Frey, pres., 3024 Fairfield Ave., plans by Pohlmeyer & Pohlmeyer, 402 W. Main St., Fort Wayne, 4 story, 60x200 ft., brick, rein.-con. hospital addn., $1,000,000.

Mo., Kansas City—CHAPEL, etc.—Grace & Holy Trinity Cathedral, 13 and Broadway, Kansas City, Zone 6, plans by Keruth O. von Achen, Porter Bldg., chapel, enlarge sanctuary, undercroft etc., addnl. elevator. Approx. $500,000.

N. Y., Brooklyn—APARTMENT—Midwood Gardens, Inc., 16 Court St., Zone 2, plans by Milton F. Kirchman, 230 W. 13 St., New York Zone 11, 6 story apartment at 1075 Ocean Parkway. $400,000.

▲ **N. Y., Mineola**—HOSPITAL—Nassau Hospital, Second St., hospital expans. and modernization, incl. 4 story wing addn. $1,500,000.

Okla., Lawton—BANK—Security Bank & Trust Co., Lawton, plans by C. L. Monnot, 3013 Classen St., Oklahoma City, Zone 6, 4 story bank, $600,000.

Pa., Pittsburgh—CHURCH—St. Joseph's Roman Catholic Congregation, 438 Ormsby St., plans by Marlier & Johnstone, 1107 Empire Bldg., 1 story 51x128 ft., 15x85 ft., brick, tile church Mount Oliver, $525,000.

▲**Tex., Abilene**—DORMITORIES—Abilene Christian College, Abilene, men's dormitories, $1,000,000, women's dormitories, $1,000,000, student center, $450,000. classrooms, $1,500,000; library and auditorium, $650,000; college bldg. addns., $1,750,000; academic bldg., $750,000; field house, athletic field, $400,000; sewers, $75,000; heating plant sys., $125,000. CD 8/27/45.

▲ **Tex., Fort Worth**—BANK and OFFICE—First National Bank, Marshall Fuller, pres., 711 Houston St., bank and office bldg., $5,700,000.

▲ **Tex., Freeport**—DWELLINGS—Republic Investment Corp., Pasandena, 180 frame type dwellings with concrete slab fdn. $1,440,000.

▲ **Tex., Houston**—OFFICE—Anderson Clayton & Co., Cotton Exchange Bldg., plans by Milton Foy Martin, 3908 Main St., 6 story, bsmnt. office, $2,000,000. CD 7/24.

Tex., Houston—DWELLINGS—W. E. Keep, 2202 Rosslyn St., 24 brick dwellings, Lamar-Wesleyan addn. $410,000.

▲ **Tex., Houston**—HOMES—J. S. Norman Building Corp., 8400 Long Point Rd., fifty 1 story, brick veteran homes, Ridgecrest addn. $2,500,000. CD 4/28/50.

Tex., Houston—SHOPPING CENTER—J. S. Norman Building Corp., 8400 Long Point Rd., 1 story, concrete, masonry, 600 sq. ft. shopping center, air-conditioned, Ridgecrest addn., $357,000.

Tex., Temple—BUILDING—Jack Austin & Leslie Crockett Constr. Co., Box 191, Temple, masonry type commercial bldg. $877,000.

Tex., Waco—BUSINESS BUILDING—Jack Austin & Leslie Crockett Constr. Co., Box 191, business bldg. $877,000.

Wash., Longview—HOUSING—Myers & Major, Vancouver, 100-unit housing project, $700,000.

▲ **Ont., Etobicoke (Postal Dist. Islington)**—DWELLINGS—Canadian General Electric Co. Ltd., 212 King St. W., Toronto, 200 dwellings, $1,000,000.

▲ **Que., Granby**—HOSPITAL WING—Rev. Sisters of Grises of St. Hyacinthe, Que., plans by S. A. Cyr, 490 Ste. Anne St., Hyacinthe, addnl. 200-bed wing at St. Joseph Hospital incl. residence for Sisters, Approx. $1,500,000.

INDUSTRIAL BUILDINGS

▲ **Ala., Huntsville**—PLANT—Courtaulds Inc., c/o Lustre Fiber, 600 5th Ave., New York, N. Y., and 16 St. Martins-le-Grand, London, England, rayon mfg. Plant $10,829,000.

▲ **Calif., Fresno**—COMPRESS—Producers Cotton Oil Co., 99 and North Ave., cotton compress, North Ave. between Maple and Chestnut Aves. $3,450,000.

Calif., Los Angeles—FACTORY—B. J. Goodrich Co., 500 S. Main St., Akron, O., factory for aircraft parts, $345,106.

Calif., Los Angeles—PLANT—Parker Appliance Co., 17325 Euclid Ave., Cleveland, O., aircraft fittings plant, $419,508.

▲ **Calif., Montebello**—PLANT—Axelson Mfg. Co., Montebello, plant for aircraft components $8,012,077.

▲ **Ill., Tuscola**—PLANT—National Petrol-Chemical Corp., Tuscola, plant to extract butane, propone, ethyl chloride from piped in natural gas company formed by Panhandle Eastern Pipeline Co. and National Distillers Products Co. $38,000,000.

▲ **Ky., Calvert City**—PLANT—B. F. Goodrich Chemical Co., Rose Bldg., Cleveland, O., plant mfg. vinyl chloride monomer on 175 acre site, $5,000,000.

La., Destrehan—REFINERY—Pan-American Southern Corp., Destrehan, fluid-hydroforming refinery unit, 2,000 bbl. capacity, $500,000, M. W. Kellogg Co., 225 Broadway, New York, N. Y., consult engr.

▲ **La., New Orleans**—PLANT—Edwin H. Fitler Co., 5625 Tacony St., Phila., Pa., cordage plant, $1,000,000.

▲ **Md., Baltimore**—POWER STATION—Consolidated Gas, Electric & Power Co., Lexington Bldg., power station on Patapsco River below Hawkins Point, incl. 125,000 kw steam electric generator turbine unit, $120,000,000.

Mich., Highland Park—PLANT—Ex-Cell-O Corp., 1200 Oakman Bldg., Detroit, plant for aircraft engine parts, $857,175.

▲ **Miss., Aberdeen**—PLANT—Textron, Inc., 50 S. Min St., Providence, R. I., mfg. plant, $3,000,000.

Neb., Lincoln—MILL—Gooch Milling & Elevator Co. 6 and South Sts. Lincoln, plans by Hazen & Robinson, 305 Stuart Bldg., 8 story mill addn., Approx. $500,000.

N. J., Dover—PLANT—McKiernan-Terry Corp., Dover, N. J., sonar equip. plant, $620,915.

N. J., Parlin—MANUFACTURING—Hercules Powder Co., 900 Market St., Wilmington, Del, mfg. bldg. addn., $331,823.

▲ **Tenn., Cleveland**—PLANT—Bowater Paper Co., 250 Park Ave., New York, N. Y., steel, concrete pulp paper mfg. plant, covering 2,000 acres, $45,000,000.

▲ **Tenn., Memphis**—FACTORY—International Harvester Co., Inc., Benjestown Rd., 10,000 sq. ft., steel, concrete factory, to mfg. hay balers and cotton pickers, $3,000,000. CD 1/26/50.

Tex., Clarkwood—LABORATORY—Celanese Corp of America, Clarkwood, plans by Smyth & Smyth and W. Wilde, Assoc. archt., Gulf Security Bldg., Corpus Christi, 1 story masonry, concrete frame, laboratory, slab fdn., airconditioning, $400,000.

Tex., Dallas—PLANT—Diamond Alkali Co., Lamar and Lenway Sts., expansion silicate of soda plant, $750,000.

▲ **Tex., Houston**—LABORATORY—Anderson Clayton & Co., Cotton Exchange Bldg., plans by Milton Foy Martin, 3908 Main St., cotton testing laboratory, $2,000,000. CD 7/24.

Tex., Kilgore—WAREHOUSE, etc.—Merritt Tool Co., Kilgore, warehouse for storage, $150,000; mechanical repair shop, $300,000.

▲ **Tex., Longview**—REFINERY—Skelly Oil Co., Longview refinery unit addn. $1,000,000. Universal Oil Products Co., c/o owner, consult. engr.

▲ **Tex., Longview**—PLANT—Whitney Chain Co., 237 Hamilton St., Hartford, Conn. chain mfg. plant, $3,500,000.

▲ **Tex., Rockdale**—PLANT—Aluminum Co. of America & Assoc., Port Lavaca, aluminum smelting and processing plant, near here, 150 mi. northeast of San Antonio, $80,000,000-$100,000,000.

▲ **Tex., San Antonio**—ELECTRIC GENERATING UNIT—City, Pub. Service Bd., 201 N. St. Marys St., addnl. electric generating unit, capacity 60,000 to 90,000 KW, $6,000,000-$10,000,000.

▲ **Utah, Salt Lake City**—REFINERY—Carter Oil Co., National Bank Tulsa Bldg., oil refinery, $1,000,000, J. R. Suman, c/o owner, engr.

Wash., Tacoma—PLANT—St. Regis Paper Co., Tideflats Tacoma, plant addn. $564,724. CD 9/11/44.

▲ **W. Va., Rachel**—PLANT—Jo-Anne Coal Mines (Sharon Steel Corp.) Rachel, coal washing plant, coal washing and screening facilities, conveyor systems etc., $1,250,000. Baton Eng. Co., Union Trust Bldg., Pittsburgh, Pa., engr. CD 6/26.

▲ **B. C., Castlegar**—MILLS—Celanese Corp. of America Canadian Celanese Ltd., 207 W. Hastings St., Vancouver, B. C., pulp and paper mills, $75,000,000.

Ont., Mount Brydges—PLANING MILL—Mount Brydges Lumber Co., Mount Brydges, 2 story, planing mill, $500,000.

▲ **Ont., Toronto**—FACTORY—Canadian General Electric Co. Ltd., 212 King St. W., transformer factory and 200 houses for factory employees in Etobicoke industrial area, Approx. $2,000,000.

UNCLASSIFIED

Mich., Lansing—PARKING RAMP—City, Earl Coller, chm., 4 story, parking ramp, N. Capitol Ave., $500,000.

▲ **Texas and Louisiana**—OIL PRODUCTS PIPE LINE—Sinclair Pipe Line Co., Commercial Bldg. addn., Houston, Tex., 280 mi., 10 in. welded joint oil products pipe line between Houston, Tex. and Baton Rouge, La. $4,680,000.

Texas—GAS PIPE LINE—Lone Star Gas Co., 1915 Wood St., Dallas, 30 mi. 12 in. gas pipe line from Bronto toward Mary Neal, $450,000.

Washington—TRANSMISSION LINES—Quinault Light Co., Quinault, 85 mi. line transmission lines, 300-kw diesel generator, Grays Harbor and Jefferson Counties, $638,999.

▲ **Ontario**—PIPE LINE—Trans-Northern Pipe Line Co. Ltd. 25 Adelaide St. E., Toronto, Ont., 400 mi. oil pipe line, 10-in. pipe along north shore Lake Ontario and St. Lawrence River connecting, Hamilton, Toronto and Montreal with 6-in. 44 mi. line between Cornwall and Ottawa $16,000,000. A. N. Horne, pres., c/o owner, consult. engr.

Ont., Ottawa—UNDERGROUND WIRING—Municipality, underground wiring on Wellington St., $600,000. G. R. Davis, Ottawa Hydro-Electric Comn., Ottawa, Ont., engr.

CONSTRUCTION REPORTS-Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
August 20, Connecticut
STREETS AND ROADS
August 20, Connecticut August 21, Massachusetts
August 22, Maine

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Bridge Constr. Corp., Augusta, Me. LB $306,570, est. $290,000, runway extension, AUGUSTA, ME., State Aeronautics Comn., State Airport, Augusta, Me.

▲ **MASSACHUSETTS** — Commonwealth of Mass., Pub. Wks. Dpt., 100 Nashua St., Boston, rejected bids June 12, Contr. C-3, Deck—electric work and snow melting sys., Central Artery, Boston. LB $1,229,047. CD 6/21.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Metropolitan Dist. Comn., 20 Somerset St., Boston, **Coleman Bros. Corp.**, 40 Central St., Boston, Mass. LB $1,008,963. Part 1, Forest Hills overpass and intersection.

A. V. Taurasi Co., Inc., 139 Jaques St., Somerville, Mass. LB $1,776,265. Part 2, Forest Hills overpass and intersection, $2,825,638. Combination of Part 1 and 2. Drumney-Duffill, Inc., 80 Boylston St., Boston, Mass., archt. and engr. Bids Aug. 2. CD 7/23.

Carmen Jiustino, 36 Upland Ave., Dorchester, Mass. CA $81,810. sanitary and surface sewers, WORCESTER, MASS. City, City Hall, Worcester, Mass. CD 7/24.

▲† **J. F. Fitzgerald Constr. Co.**, 212 Essex St., Boston, Mass. LB $1,800,000. laboratory bldg., Hanscom Airport, BEDFORD, MASS. U. S. Eng., 857 Commonwealth Ave., Boston. CD 7/10.

▲ **CONNECTICUT**—State Hy. Dpt., Hartford.

D. V. Frione & Co., Inc., 87 Foxon St., New Haven, Conn. LB $1,352,046. hy. F.A. Proj. U 46 (7), East Hartford and Glastonbury: $401,993. hy., F.A. Proj. S 93 (1), Glastonbury; $1,713,932, combination of both projects.

D'Addario Constr. Co., 513 Boston Ave., Bridgeport, Conn., LB $784,721. hy., F.A. Proj. UI 29 (16), Darien. Bids July 30. CD 7/17.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Turner Constr. Co.**, 38 Newbury St., Boston, Mass. CA $2,000,000. CLASSROOM bldg. and DINING HALL, Sen. Nelson W. Aldrich Hall, BOSTON, MASS. Harvard Business School, 16 N. Harvard St., Cambridge, Mass. Perry Shaw & Hepburn, Kehoe & Dean, 31 St. James St., Boston, Mass., archts. Maurice Reidy, 101 Tremont St., Boston, Mass., engr. CD 12/4, under Mass., Cambridge.

Town, Supt. Schools, 14 Union St., Hamilton, Mass. rejected bids July 19, elementary and high schools addn., alterations, Asbury St. and Union St., HAMILTON, MASS. LB $835,000. CD 7/25.

Olson & Annleby, 222 Union St., New Bedford, Mass. LB $595,277. Vocational High SCHOOL addn., alterations, NEW BEDFORD, MASS. City, Supt. Bldgs., Municipal Bldg., New Bedford, Mass. Erford W. Poole, 4 Chapman Bldg., New Bedford, Mass., archt. Clifford & Rhoades, 53 State St., Boston, Mass., struct. engr. Bids Aug. 2. CD 7/19.

Tornabene Bros. Co., 372 Langley Rd., Newton, Mass. LB $791,338. Claflin Elementary SCHOOL, NEWTONVILLE, MASS. City, Pub. Bldg. Comn., City Hall, Newton, Mass. Maginnis & Walsh, 126 Newbury St., Boston, Mass., archts. Bids Aug. 1. CD 7/24.

Vara Constr. Co., Inc., 718 Huntington Ave., Boston, Mass. LB $722,177. Clark Street Elementary SCHOOL, WORCESTER, MASS. City, School Dpt., City Hall, Worcester, Mass. L. W. Briggs Assoc., Inc., 90 Park Ave., Worcester, Mass., archt. Bids Aug. 2. CD 7/16.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
August 21, Pennsylvania
STREETS AND ROADS
August 24, 31, Pennsylvania
August 28, New Jersey August 29, New York

BIDS ASKED—BUILDINGS

N. Y., New York—SCHOOL—B.A. 8/21—Bd. Educ., 49 Flatbush Ave. exten., Brooklyn, general constr., plumbing and drainage, heating and ventilating, electrical work and lighting fixtures for Junior High School 123, Bruckner Blvd., between Stratford and Morrison Aves., Bronx Boro, $2,732,200. Plans deposit $30 general constr., $9 each others. Extended date. CD 7/24.

Pa., Scotland—COTTAGES—B. A. 8/29—General State Auth., 18 and Herr Sts., Harrisburg, boys' cottages at Scotland School for veterans' children, $600,000. Plans deposit $10, Frank M. Highberger, 666 Washington Rd., Pittsburgh, Zone 28, archt. A. F. Jones, c/o owner, ch. engr. CD 1/24.

N. J., Bordentown—POLICE BARRACKS—B.A. 9/5—At office of Director, Div. Purchase & Property, State House, W. State St., Trenton, Zone 7, general, plumbing, heating and ventilating electric, structural steel and misc. iron work in connection with State Police Barracks. Plans deposit $25; adv. ENR 8/16.

N. J., Princeton—POLICE BARRACKS—B.A. 9/5—At office Director, Div. Purchase & Property, State House, W. State St., Trenton, Zone 7, general, plumbing heating and ventilating, electric, structural steel and misc. iron work in connection with new State Police Barracks. Plans deposit $25; adv. ENR 8/16.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Golder Constr. Co.**, Market St., National Bank Bldg., Phila., Pa., CA, $1,031,362. jet fuel and lubricating oil facilities at McGuire Air Force Base, Fort Dix, WRIGHTSTOWN, N. J. Dpt. Army, 121 N. Broad St., Phila., Pa. CD 3/29.

W. V. Pangborne & Co., 1927 Montgomery Ave., Phila., Pa. CA, $584,721, completion Locust St. Subway, PHILA., PA. Dpt. City Transit, City Hall Annex, Phila., Pa. Bids July 10. CD 6/25.

M. & J. B. McHugh, 892 N. Markoe St., Phila., Pa., CA, $238,449, water mains Glenfield and other locations, 501 WWI; CA, $73,621 water mains various locations 562 WWI; CA $177,230, removal installation and dismantling valves in distr. sys. of various locations, 527 WWI, PHILA., PA. Dpt. P. Wks., City Hall Annex, Phila., Pa. Grand total $489,300. Bids July 25. CD 7/16.

BUILDINGS

LOW BIDS AND CONTRACTS

Streeter Associates, Inc., Elmira, N. Y., CA, $980,346 general construction Elmira HOUSING Proj. NY 17B in area bounded by Clinton Baldwin and Dickinson Sts. and Elmira Neighborhood House, ELMIRA, N. Y. Elmira Housing Auth., 346 Woodlawn Ave., Elmira, N. Y. Bids July 17. CD 6/26.

Merrick Rambler Homes, c/o Alwin Cassena, Jr., archt., 116-55 Queens Blvd., Forest Hills, N. Y., Owner Builds, $600,000. 60 HOUSES in Merrick Heights Section, MERRICK, N. Y.

The Austin Co., 16112 Euclid Ave., Cleveland, O., CA $240,000, chemical PLANT and WAREHOUSE, NORWICH, N. Y., Norwich Pharmacal Co., 330 W. 42 St., New York, N. Y.

John W. Rouse Constr. Corp., Gouverneur, N. Y., CA $893,800, SCHOOL and BUS GARAGE, NORWOOD, N. Y. Bd. Educ., Norwood Central School Dist., Norwood, N. Y. Bids July 20. CD 7/12.

Stewart M. Muller, Inc., 47 South Riverside Ave., Croton-on-Hudson, N. Y., CA general construction topsoil and planting; **Michael Harmonay Corp.**, 567 Yonkers Ave., Yonkers, N. Y., CA plumbing and gas fittings; **Grant T. Geelan**, 33-21 Francis Lewis Blvd., Flushing, L. I., N. Y., CA heating; **Port Chester Electrical Constr. Corp.**, 329 N. Main St., Port Chester, N. Y. electrical work. Est. $700,000, 70 units in 15 buildings HOUSING proj. NY 13-1, TARRYTOWN, N. Y. Tarrytown Housing Auth., 118 Main St., Tarrytown, N. Y. Bids June 19. CD 6/13.

▲ **Crown Heath Homes**, c/o Matern & York, archts., 90-04 161 St., Jamaica, N. Y., Owner Builds, $1,750,000. 118 HOUSES on 25-acre site, Jerusaleum Ave., WANTAGH, N. Y.

▲ **D. O. Evans Inc.**, 1319 N. Broad St., Hillside, N. J. CA $4,000,000. design and construct, service parts PLANT on Route 29, BRIDGEWATER, N. J. Mack Trucks Inc. 350 Fifth Avenue, New York, N. Y.

20th Century Homes, Inc., 27 and Marlton Pike, Camden, N. J. Separate Contracts, $665,000, RESIDENTIAL DEVELOPMENT, Collings Ave. and Browning Rd., COLLINGSWOOD, N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, N. J., archt.

P. Jantelle, Inc., 571 S. Tenth St., Newark, N. J., CA $372,000, Hillside High SCHOOL addn., HILLSIDE, N. J. Bd. Educ., Hillside Twp., 1085 Liberty Ave., Hillside, N. J. Bids July 16. CD 7/2.

▲ **Sunnyfield Homes** c/o Erwin Gerber, archt., 1180 Raymond Blvd., Newark, N. J., Owner Builds, $1,500,000, 254 HOUSES on 60-acre site bounded by St. George Ave. DeWitt Terrace and Styles St., LINDEN, N. J.

Strawbridge Homes, Inc., 27 St. and Marlton Pike, Camden, N. J. Separate Contracts, $800,000, RESIDENTIAL DEVELOPMENT, Strawbridge Park Manor, MOORESTOWN, N. J. Henry W. Petty, 141 Chestnut St., Moorestown, Pa., archt.

▲ **Harry Friedman** c/o Percy Simon, archt., 362 Cedar Lane, Teaneck, N. J., Owner Builds, $1,000,000, 50 1 family HOUSES on 11½ acre tract at River Dr. and Howard St., PASSAIC, N. J.

Evans & Co., 1445 N. Broad St., Hillside, N. J. LB $908,478, Regional High SCHOOL, Main St., ROCKAWAY, N. J. Morris Hills Regional Dist., Bd. Educ, 33 Union St., Rockaway, N. J. Bids July 10 CD 6/28.

Robel Constr. Co., 505 McMillen St., Johnstown, Pa. LB $300,000. 2 story, brick, steel high SCHOOL addn., incl. shop and cafeteria, BEDFORD, PA. Bedford General Auth., Bedford, Pa. Sorber & Hoone, First National Bank Bldg., Greensburg, Pa., archts.

Boardman-Smith Corp., 1322 W. Airdrie St., Phila., Pa., Separate Contracts, $300,000 RESIDENTIAL DEVELOPMENT, Eastburn and 21 Sts.; $540,000, residential development, Hasbook and Passmore Sts., PHILA., PA.

Swarthmore Gardens, Inc., 1311 Market St. National Bank Bldg., Phila., Pa. Separate Contracts, $900,000, residential development, Westminster Ave., SWARTHMORE, PA.

▲ **Cramer-Volmerhausen Co.**, 2601 Conn. Ave. N. W., Wash., D. C., $1,941,900, LB, DENTAL SCHOOL at Howard University W St. N. W., WASH., D. C. Public Bldgs. Service, General Services Admin., General Services Bldg., Wash., 25, D. C. Bids Aug. 7. CD 8/3.

▲ **Casselmac Builders, Inc.**, 69 and Walnut Sts., Upper Darby, Pa., Separate Contracts, $4,500,000, RESIDENTIAL DEVELOPMENT, Elkton Rd., NEWARK, DEL.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
August 22, September 5, Louisiana
STREETS AND ROADS
August 22, September 5, Louisiana

BIDS ASKED—BUILDINGS

† **Va., Norfolk**—BUILDING—B.A. 8/21—Dist. Pub. Wks. Office, Headquarters, Fifth Naval Dist., U. S. Naval Base, Norfolk, Zone 11, altering bldg. 2 at U. S. Naval Base, (Cinclant Headquarters) NOY 26838, Spec. 28849. Plans deposit $10.

S. C., Greer—SCHOOL—B.A. 8/22—City, high school. Plans deposit $50, Harold Woodward, Spartanburg, archt. CD 4/26/46.

La., Ringgold—SCHOOL—B.A. 8/28—State, Bd. Educ., Capitol Bldg., Baton Rouge Trade School. Plans deposit $50. Smith & Padgett, 512 Ouachita Bank Bldg., Monroe, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

R. H. Bouligny, Inc., 433 W. Morehead St., Charlotte, N. C. CA $269,567. rural telephone lines, NORTH CAROLINA. Eastern Rowan Telephone Co., Granite Quarry, N. C. Bids July 31. CD 7/19.

▲† **Bowe Contg. Co.**, Augusta, Ga. and **T. E. Ritter Corp.**, 426 W. York St., Norfolk, Va. CA $2,050,116, airport paving, etc., NOY 28421, EDENTON, N. C. Pub. Wks. Office, Officer in Charge of Construction, Fifth Naval Dist., Norfolk, Va. CD 6/29, under LB.

Greenville Utilities Comn., Martin Swartz, supt., Greenville, N. C. rejected bids July 27, 242 mi. rural distr. lines, in Beaufort, Craven and Pitt Counties, GREENVILLE, N. C. LB. $383,044. CD 7/13.

Blythe Bros. Co., 2911 Hutchinson Ave., Charlotte, N. C. CA $376,162, rural water supply line, WILMINGTON, N. C. City, J. R. Benson, mgr., Wilmington, N. C. Bids July 31. CD 7/13.

▲ **FLORIDA**—State Rd. Dpt., Palm Beach County Court House, West Palm Beach.

Allied Structural Steel Companies, 20 N. Wacker Dr., Chicago, Ill., and **Industrial Contg. Co.**, 3050 4 Ave. S., Minneapolis, Minn., CA, $4,114,696, superstructure comprising steel I-beam spans, continuous plate girder spans, continuous truss spans, electrically operated double bascule leaf portions of bascule piers, Gilmore St. Bridge across St. Johns River, Road 5, Job 7022-275-B, Duval Co. Bids July 24. CD 7/30, under LB.

† **Zaret Constr. Co.**, 1901 West Ave., Miami Beach, Fla. CA $435,001. warehouse and rehabilitation of Bldg. 310 at Long Range Proving Ground, Patrick Air Force Base, Inv. 52-5, COCOA, FLA. U. S. Eng., 375 Riverside Ave., Jacksonville, Fla. Bids July 31. CD 7/13.

Gulf Service Co., Foley, Ala., CA $594,000. Owner Builds. Telephone lines in Baldwin Co., ALABAMA.

BUILDINGS

LOW BIDS AND CONTRACTS

Laburnum Constr. Corp., 918 E. Main St., Richmond, Va. LB $763,635. DENTAL bldg., for Medical College of Virginia, RICHMOND, VA. State of Virginia, Richmond, Va. Bids Aug. 1. CD 7/16.

Doyle & Russell, Central National Bank Bldg., Richmond, Va. LB $847,772, high SCHOOL, VIRGINIA BEACH, VA. Town, Virginia Beach, Va. Bids July 26. CD 7/6.

Dales Constr. Co., 8 St., Virginia Beach, Va. CA $350,000. 54 HOMES, VIRGINIA BEACH, VA. Pine Acre Homes, Inc., c/o contractor.

▲ **Baker & Coombs, Inc.**, Demain Ave., Morgantown, W. Va. CA $1,471,206, HOSPITAL for Sacred Heart Hospital, RICHWOOD, W. VA. Pallottine Missionary Sisters, c/o contractor. CD 7/10, under LB.

Willfred Constr. Co., Palm Beach, Fla., Owner Builds, Approx. $750,000. 150 HOMES, Silver Beach Rd., PALM BEACH, FLA.

▲ **Tidewater Constr. Co.**, 538 Front St., Norfolk, Va. CA $25,000,000, MILL EXPANSION, PORT ST. JOE, FLA. St. Joe Paper Co., Port St. Joe, Fla. Awarded Aug. 1.

(Continued on page 116)

1. It's FASTER!
2. It's CHEAPER!

—Two BIG Reasons Why The BARCO Rammer *is the answer to your* SOIL COMPACTION PROBLEMS

Barco Rammer in use on Benbrook Dam project near Fort Worth, Texas.

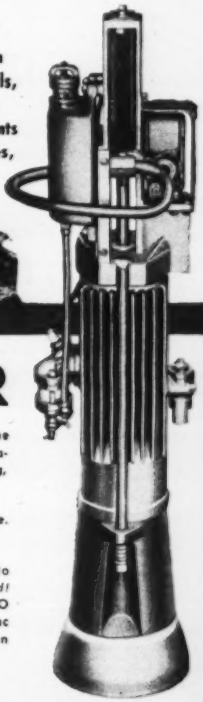
● The *thrusting* heavy impact of the Barco Rammer gives you deep, penetrating compaction. Barco's work fast, too —50 to 60 blows per minute—with no operator fatigue.

A Barco Rammer operating on lifts of 12 to 20 inches gives specified compaction at costs as low as one-fifth of other methods*. Even where specifications limit lifts to 4 to 6 inches, the Rammer gives substantial savings.

The Barco Rammer regularly turns out 160 to 180 cubic yards of compacted fill per eight-hour day. *Figure your costs and you will figure Barco! IT'S FASTER! IT'S CHEAPER!*

*Tests certified by government agencies.

for soil compaction close to walls, culverts, and abutments —in trenches, ditches



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SIMPLE, RUGGED, PORTABLE—The improved Barco Rammer is a completely self-contained work unit. Take it anywhere; no auxiliary or extra equipment required. Gets the job done with lowest capital investment in equipment!

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ANYONE CAN OPERATE—Ask for the nearest Barco distributor to give you a demonstration. See how easy it is to operate. No lifting, straining, or skill required.

SAFE—Natural work position keeps operator safe. Operator controls each stroke. Runaway-proof.

QUICK DELIVERY—Now is the time to order while stocks are available. *Be prepared!* Catalog and information on request. BARCO MANUFACTURING COMPANY, 1814-J Winnemac Ave., Chicago 40, Illinois. In Canada; The Holden Co., Ltd., Montreal.

BARCO DISTRIBUTORS LOCATED IN ALL PRINCIPAL CITIES

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

(Continued from page 117)

▲† **U. S. Eng.**, P. O. Box 1169, Mobile 7, Ala., rejected bids July 30, base maintenance SHOP at Fort McClellan Ordnance Depot, ANNISTON, ALA. CD 8/6, under LB.

▲ **J. G. White Engineering Corp.**, 80 Broad St., New York, N. Y. CA **$15,000,000** soda ash PLANT, BATON ROUGE, LA. Solvay Process Div., Allied Chemical & Dye Corp., 61 Broadway, New York, N. Y. (CORRECTION-contractor). CD 7/27, under CA.

† **McChesney Constr. Co.**, Bowling Green, Ky. LB **$486,-094**, SCHOOL, FORT CAMPBELL, KY. Office of Housing & Home Finance Agency, 206 LaSalle St., Chicago, Ill. Bids Aug. 2. CD 7/24.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
August 28, Indiana

Ind., Fort Wayne—B.A. 8/21—Bd. P. Wks., City Hall, improv. sections State Blvd., Rudisill Blvd., Anthony Blvd., Harrison, E. Wayne, Calhoun, John and Spring Sts. and Fairfield Ave, $600,000. CD 6/22.

BIDS ASKED—BUILDINGS

▲ **Mich., Lansing**—COMPRESSOR and TURBINE UNIT—B.A. 8/22—Oldsmobile Div. General Motors Corp., J. F. Wolfram, mgr., 1014 Townsend St., 700,000 sq. ft. compressor and turbine unit, W. Saginaw St., $6,000,000. Argonaut Realty Div. General Motors Corp., General Motors Bldg., Detroit, archts. CD 4/13.

Ind., Charlestown—SCHOOL—B.A. 8/24—Charlestown Twp., K. L. Taff, trustee, Charlestown, 2 story, 200x360 ft. brick, stone elementary and high school. $910,000. McGuire & Shook, 1400-01 Fletcher Trust Bldg., Indianapolis, Zone 4, archts. Rotz Eng. Co., 804 Merchants Bank Bldg., Indianapolis, Zone 4, mech. engr.

Mich., Detroit—HOSPITAL—B.A. 8/24—Henry Ford Hospital, 2799 W. Grand Blvd., brick, steel, concrete hospital and clinic unit, $500,000. Voorhees, Walker, Foley & Smith, 101 Park Ave., New York, N. Y., archts. CD 1/23.

▲ **Ill., Hinsdale** — HOSPITAL — B.A. 8/28 — Hinsdale Sanitarium & Hospital, 140 Oak St., 3 story, bsmnt. hospital, $2,500,000. Fugard, Burt & Wilkinson, 520 N. Michigan Ave., Chicago, Zone 11, archts. CD 7/13/50.

▲ **Ill., Kankakee**—PLANT, etc.—B.A. 8/30—Armour & Co., Union Stock Yards, Chicago, Zone 9, pharmaceutical laboratory and plant, $5,000,000, Holabird & Root, & Burgee, 180 N. Wabash St., Chicago, Zone 1, archts. CD 2/8.

Ill., Huntley—SCHOOL—B.A. In January—Bd. Educ., Huntley, combination high and elementary school, incl. gymnasium, $400,000. Leroy W. Thompson, 355 Comdon Ave., Elgin, Ill., archt. No bids received 8/1. CD 4/25.

▲ **Mich., Dearborn**—PLANT—Bids Asked—Ford Motor Co., 3001 Schaffer St., Dearborn, concrete, masonry plant addn. to slab reheat furnace bldg., Giffels & Vallet, Inc., 1000 Marquette Bldg., Detroit, archt. CD 3/2/50.

SOON LETS CONTRACT—BUILDINGS

Ill., Joliet—OPERATIONS BLDG, etc.—Elgin, Joliet & Eastern Ry. Co., F. G. Campbell, ch. engr., East Joliet Yd, Joliet, Ill., soon lets contract operations and office, $450,000. Svedrup & Parcel, 915 Olive St., St. Louis, Mo., archts.

▲ **Ill., McCook**—MANUFACTURING—B.A. 8/16—Electromotive Div., General Motors Corp., General Motors Bldg., Detroit, Mich., soon lets contract, 100,000 sq. ft. manufacturing bldg. addn. $3,000,000. Argonaut Realty Div., General Motors Research Bldg., Detroit, archt.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Lucas Co. Child Study Institute Bldg. Comm.**, Court House, Toledo, O. rejected bids Aug. 1, 2 and 3 story, Child Study INSTITUTE BLDG. on Michigan exten. thru to 10 St., TOLEDO, O. LB **$1,263,000.** CD 8/6, under LB.

▲† **Whittenberg Constr. Co.**, 2214 Floyd St., Louisville, Ky., CA, **$2,581,000**, 2 WAREHOUSES, railroad yards railroad spurs, etc. at Hoosier Ordnance Plant, CHARLESTOWN, IND. U. S. Eng., 830 W. Brodaway, Louisville, Ky.

Crestmoor Home Builders Inc., 445 Broadway, Gary, Ind., Owner Builds **$500,000**, 50 HOMES in Hobart area, HOBART, IND. Harry McComb, 6708 Jackson St., Hammond, Ind., archt. Awarded Aug. 2.

▲ **Arnold Lies Constr. Co.**, 1515 New York St., Aurora, Ill. CA **$1,000,000**. CHURCH, RECTORY addn., SCHOOL addn., CONVENT addn., AURORA, ILL. Our Lady of Good Council Parish, 620 S St., Aurora, Ill. Bids Apr. 30, awarded July 26. CD 4/19.

La Salle Constr. Co., 327 S. La Salle St., Chicago, 4, Ill., CA, **$700,000**, PLANT addn., CHICAGO, ILL. Continental Can Co., 7600 S. Racine St., Chicago, Ill. W. Fred Dolke, 189 Madison St., Chicago, 3, Ill., archts. Awarded July 31.

Sherman Olson Co., 600 W. Jackson St., Chicago, 6, Ill., CA **$500,000**, 46,000 sq. ft. paper making PLANT, CHICAGO, ILL. Container Corp. of America, 38 S. Dearborn St., Chicago, Ill. Morton L. Pereira, 100 W. Monroe St., Chicago 3, Ill., archts. Awarded July 30. CD 5/23.

Housing Auth. of Henry Co., Cambridge, Ill., rejected bids June 19, LB. combined, **$624,300**, HOUSING Project ILL. 9-2 and Ill 9-3 KEWANEE, ILL. CD 7/23, under LB.

▲ **Fallon O'Donovan & Rassas, Inc.**, 4619 School St., Chicago, Ill., CA, **$1,250,000**, 1 story, brick, concrete, steel, SCHOOL, PARK FOREST, ILL. School Dist. 163 2940 Western Ave., Park Forest, Ill. Awarded July 30. CD 7/19.

Cunningham Bros. Constr. Co., 359 E. Grand St., Beloit, Wis., CA, **$750,000**, 90,000 sq. ft. FACTORY, SOUTH BELOIT, ILL. C. H. Besly & Co., 118 N. Clinton St., Chicago, 6, Ill. CD 6/14.

S. Goetsch, 3204 A N. 13 St., Milwaukee 6, Wis. CA approx. **$500,000**. CHURCH, MILWAUKEE, WIS. Our Savior Lutheran Church, 1214 S. 9 St., Milwaukee 4, Wis. CD 2/14/50.

Rozycki Brothers, 2268 E. Forest St., Detroit, Mich. CA **$600,000**, 2 story, bsmnt., brick, steel, concrete Mumford High SCHOOL, Wyoming St., DETROIT, MICH. City, Bd. Educ., Detroit, Mich. Bids July 16. CD 7/3.

John C. Westphal, 12274 Coyle St., Detroit, Mich. CA **$600,000**. brick, steel elementary SCHOOL, EAST DETROIT, MICH. Bd. Educ., East Detroit, Mich. Bids July 30. CD 7/25.

▲ **A. W. Kutsche & Co.**, 2924 W. Grand Blvd., Detroit, Mich. CA **$1,500,000**. brick, steel Lincoln High SCHOOL, VAN DYKE, MICH. Bd. Educ., Warren Twp., Dist. 5, Van Dyke, Mich. Bids July 23. CD 7/2.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Tex., Stamford—B.A. 8/31—City, Clyde Westfall, mayor, paint Creek Dam and water supply line, $800,000. Plans deposit $20 each. Freese & Nichols, 407 Danciger Bldg., Fort Worth, engrs. CD 4/27.

▲† **Tex., Waco**—ACADEMIC BLDG.—B.A. 8/31—U. S. Eng., Box 61, Tulsa 2, Okla., 3 story, 166,000 sq. ft. concrete, academic bldg., Eng. 34-066-52-4, $1,850,000. Plans deposit $50. Joe Ward, Nacol Bldg., Wichita Falls, and Jesse G. Dixon, Wichita Falls, archts. CD 8/6.

BIDS ASKED—BUILDINGS

Tex., Dallas—SCHOOL—B.A. 8/28—Dallas Independent School Dist., 3700 Ross St., J. L. Long Junior High School addn. $450,000. Plans deposit $25, W. S. Richter, Commerce Bldg., and Mark Lemmon, 1210½ Main St., engrs. CD 7/20/50.

▲ **Mont., Great Falls**—HOUSING—B.A. 9/5—U. S. Eng., 19 E. Poplar St., Walla Walla, Wash., construct, manage, finance 400 housing units, Great Falls Air Force Base, $3,200,000. CD 3/15.

▲ **Texas** — PUMPING STATIONS — Bids Asked—Ranch Pipe Line System, c/o Shell Pipe Line Corp., Shell Bldg., Houston, pumping station, El Dorado, $225,000; pumping station, Genoa, $250,000; pumping station, La Grange, $300,000; pumping station, McCamey, $275,000; products storage farm, McCamey, $500,-000. CD 7/19.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MISSOURI**—State Hy. Dpt., Jefferson City,
Knutson Gould Contr. Co., 3527 Broadway, Kansas City, Mo., LB **$280,563**, one 140 ft., two 90 ft., steel plate girder spans, Cass Co.
The Maxwell Bridge Co., Columbus, Kan., LB **$927,966**, ten 180 ft. steel truss spans, Sta. 375 plus 98, Ozark Co.
Porter De Witt Constr. Co., Poplar Bluff, Mo., LB **$105,312**, two 70 ft., one 80 ft. continuous I beam spans, Sta. 576 plus 68 over Perque Creek.
J. E. Latta Constr. Co., and **Henry Perkinson Constr. Co.**, 6609 Latta Place, St. Louis, Mo., LB **$92,787**, two 33 ft., one 43 ft. I-beam spans, Sta. 30 plus 81 over Coldwater Creek, St. Louis Co.
M. E. Gillioz, Monett, Mo., LB **$230,428**, two 180 ft., steel truss, two 40 ft. I-beam spans, concrete slab, Taney Co. Bids Aug. 3. CD 7/18.
Hocker Constr. Co., Box 2025, Waco Tex. CA **$558,507**, flying training air force bldg., WACO, TEX. L. J. Reicher, c/o W. Cocke Jr., archt., 15-7 Franklin St., Waco, Tex. Awarded Aug. 4. CD 8/8, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Steenberg Constr. Co.**, 1371 Marshall Ave., St. Paul, Minn. CA **$1,130,000**, steam generating PLANT and electric transmission lines, CHAMOIS, MO. Central Electric Power Co-operative, Linn, Mo. CD 3/16.

▲ **Long-Turner Constr. Co.**, Rialto Bldg., Kansas City, Mo. CA Total Est. **$25,000,000-$30,000,000**, general constr. 1 story, 650x1,600 ft. PLANT BUILDING, 2 story, 160x350 ft. OFFICE on 127 acre site at Claycomo, 12 mi. from downtown Kansas City, KANSAS CITY, MO. Ford Motor Co., 856 Penobscot Bldg., Detroit, Mich. Giffels & Vallet, Inc., 1000 Marquette Bldg., Detroit, Mich., archt. E. L. Maples, c/o owner, resident engr. CD 1/5, under Contracts Awarded.
Schutte Lumber Co., 3001 Southwest Blvd., Kansas City 8, Mo. Own Forces. **$500,000**, rebuilding 250,000 sq. ft. OFFICE AND GARAGE on 10½ acre tract, Southwest Blvd., KANSAS CITY, MO.

▲ **Joseph H. Vatterott Realty & Building Co.**, 10253 St. Charles Rock Rd., St. Louis 14, Mo. Own Forces. **$1,000,000.** 200 asbestos shingle BUNGALOWS, on 50 acre tract on Woodson Rd. north of St. Charles Rock Rd., incl. sewage disposal plant, street paving, sanitary and storm sewers, ST. LOUIS CO., MO.
Oscar F. Suggs, Malvern, Ark. Owner Builds. **$500,000.** 100 HOMES, MALVERN, ARK.

▲ **T. C. Bateson Constr. Co.**, Irwin-Keasler Bldg., Dallas, Tex. LB **$2,060,900.** 8 story, bsmnt. HOSPITAL, concrete pier, steam heating; **$559,700.** masonry NURSES HOME, concrete pier and beam fdn., steam heating, LUBBOCK, TEX. Lubbock Memorial Hospital, Lubbock, Tex. Bids Aug. 2. CD 7/13.

▲ **Tex., Midland** — PLANT — Tex-Harvey Gasoline Co., Midland, will not receive bids, high-pressure absorption type gasoline plant, **$5,750,000.** Project held up indefinitely. CD 4/30.

Universal Oil Products Co., Longview, Tex. CA **$775,-000** addnl. REFINERY unit for special refining, LONGVIEW, TEX. Skelly Oil Co., Longview, Tex. CD 7/31.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
August 29, California

Wash., Wenatchee—B.A. 8/24—Chelan Co. Public Utility Dist. c/o Stone & Webster Eng. Corp., engrs., 49 Federal St., Boston, Mass., main control switchboard of 12 panels to control 6 generators and 2 power transformers banks; 6 metal-clad cubicles for surge protective equip. and flyball transformers; 6 generator neutral circuit breaker cubicles for expansion of Rock Island Dam. CD 1/2.

Ore., Coquille—B.A. 8/27—City, City Hall, filtration plant, Howland, Hayes & Merryfield, Corvallis, engrs. CD 1/26.

† **Washington**—B.A. 8/28—U. S. Eng., Bldg 602, City-County Airport, Walla Walla, Wash., constr. levee 4A and pumping plant, on right bank of Columbia River 6 mi. west of Kennewick, Benton Co., Serial No. CIVENG 45-164-52-7.

† **California**—B.A. 8/30—Bureau Reclamation, Dpt. Interior, Goleta, contr. Sheffield Tunnel, South Coast Conduit, Carpenteria Section, Cachuma Proj., Spec. DC-3500. L. N. McClellan, Bldg. 1-A, Denver Federal Center, Denver, Colo., ch. engr. CD 4/20/45.

† **California**—B.A. 8/30—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing del. f.o.b. cars shipping point or f.o.b. cars Lindsay, Calif., valves, suppressors, for 1 low level distr. system for Trauger Pumping Plant, Lindsay-Strathmore Irrigation Dist., Friant-Kern Canal Distribution Systems, Central Valley Proj., Spec. DS 3509. L. N. McClellan, ch. engr.

Ore., Portland—B.A. 9/6—City, City Hall, Willamette River crossing, sewer proj. Plans deposit $25. L. G. Apperson, engr. CD 3/3/44.

BIDS ASKED—BUILDINGS

† **California**—WAREHOUSE—B.A. 8/28—Bureau Reclamation Dpt. Interior, 2430 J St., Sacramento, Calif., constr. warehouse for Folsom Power Plant, Folsom Unit, American River Div., Central Valley Proj., approx. 2 mi. northeast of Folsom, Spec. DC-3499. adv. ENR 8/2.

† **Calif., San Fernando**—LAUNDRY—B.A. 8/28—Veterans Admin., Vermont Ave. between H & I Sts. N.W., Wash., 25, D. C. laundry bldg. No. 50 for Veterans Administration Hospital Spec. 51137. Proj. 12-4220.

Wash., Colville—SCHOOL—B.A. 8/28—School Dist. 115, Colville, elementary school, $300,000. Plans deposit $25. H. B. Gessel, 1 E. Main St., Walla Walla, Wash., archt. CD 5/14.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

NEVADA—State Hy. Dpt., Carson City,
Wells Cargo, Inc., 1775 E. 5 St., Reno, Nev., CA, **$259,990** constr. portion Secondary Hy. sys. approx. 38.453 mi. from junction with U. S. 50 at Austin to point approx. 38 mi. north (Austin-Battle Mountain Rd.) Lander Co., CD 7/25

† **J. A. Terteling & Sons Inc.**, 401 Fairview Ave., Boise, Idaho, CA, **$510,276**, Union Pacific Ry. bridge over Walla Walla River and overpass for State Hy. 3. Inv. No. 51-67, Wallula, Walla Walla Co., WASHINGTON. U. S. Eng., City-County Bldg., Walla Walla, Wash. Bids July 17, awarded Aug. 2. CD 7/23, under LB.

† **U. S. Eng.**, Bldg., 602, City-County Airport, Walla Walla, Wash., rejected bids June 18, alert hangar at Larson Air Force Base, MOSES LAKE, WASH. LB **$771,380.** CD 6/27, under LB.

▲ **Consolidated Western Steel Corp.**, 5700 S. Eastern Ave., Los Angeles, Calif., CA, **$1,413,000**, 36 crest gages for expansion of Rock Island Dam, WENATCHEE, WASH. Chelan Co. Public Utility Dist., Wenatchee, Wash. Bids July 23. CD 6/28.

▲ **CALIFORNIA**—State Div. Hys., Los Angeles, Calif., Fredericksen & Kasler, 212 13 St., Sacramento, Calif., LB, $2,007,473, $2,012,328 alternate, grading, surf. 9.3 mi. 4 rein.-con. bridges, 2 culverts between .6 mi. north of Devere and .2 mi. south of Gish Underpass, San Bernardino Co. CD 7/12.

▲† **Trepte Constr. Co.**, P. O. Box 231, San Diego, Calif., LB, $3,070,000 concrete, $3,150,000 steel,

aircraft maintenance hangar NOY 27061, Spec. 29061. MIRIMAR, CALIF. Bids July 19. CD 7/3.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† U. S. Eng., 10 W. 1 South St., Salt Lake City, Utah, rejected bids May 29, 8 bldgs. in Area E incl. post exchange, service station, enlisted men's club guard house, school, hospital, nurses quarters and attendant dormitory, commissary and chapel, Dugway Proving Grounds TOOELE, UTAH. LB $1,360,610. CD 6/8, under LB.

▲ Leland McArthur, 214 Stewart St., Las Vegas, Nev., LB $1,250,000, construct, manage, and finance 150 Wherry HOUSING UNITS, at Deseret Chemical Depot, TOOELE, UTAH, U. S. Eng., 74 New Montgomery St., San Francisco, Calif., Bids July 25. CD 6/15.

▲ H. K. Ferguson Co., 19 Rector St., New York, 6, N. Y. CA $14,000,000, rehabilitating BUILDINGS to produce metallic titanium, HENDERSON, NEV. Titanium Metals Corp. of America, (National Lead Co., & Alleghany-Ludlum Steel Co.), 60 E. 42 St., New York 17, N. Y.

▲ Macdonald Bldg. Co., 1517 S. Tacoma Way, Tacoma, Wash., LB, $1,253,188 general contract: University Plumbing & Heating Co., 3941 University Way, Seattle, 5, Wash., LB, $350,700, mechanical work, four 2 story, bsmnt., rein.-con. WARD bldgs. at Rainier State School Units G-3 and 4, B-3 and 4, BUCKLEY, WASH. State Dpt. P. Institutions, Olympia, Wash. Bids July 31. CD 7/5.

Strand & Sons, 3939 University Way, Seattle, 5, Wash., LB $498,000, 2 and 3 story, rein.-con. CHURCH, SEATTLE, WASH. University Congregational Church, E. 43 St. and 15 Ave. N. E., Zone 5, Wash. Jones & Bindon, Hoge Bldg., Seattle, 4, Wash., archts. CD 6/23/47.

▲ M & K Corp., 405 Montgomery St., San Francisco, Calif., Frederickson & Watson Constr. Co., 873 81 St., Oakland, Calif., Piombo Constr. Co., 1571 Turk St., San Francisco, Calif., CA, $6,758,000, general contract, State Mental HOSPITAL, ATASCADERO, CALIF. State Div. Architecture, P. Wks., Bldg., Sacramento, Calif. Bids June 26, awarded 8/3. CD 7/6, under LB.

R. J. Daum Constr. Co., 6803 West Blvd., Inglewood, Calif., CA, $560,000, OFFICE on 12½ acre site in LOS ANGELES, CALIF. Southern Counties Gas Co. of California, 810 S. Flower St., Los Angeles, Calif.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† Peter Kiewit Sons Co., 1024 Omaha National Bank Bldg., Omaha, Neb. LB, $8,403,313, est. $9,730,267, outside utilities at Ladd Air Force Base, Inv. No. S95-507-51-126, ALASKA. U. S. Eng., New Washington Hotel, Seattle, 1, Wash. Bids July 31. CD 7/19.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

B. C., Westview — WHARF — B.A. 8/22 — Secy. Dpt. Transport Ottawa, Ont., wharf reconstr. Approx. $425,000. Plans deposit $50. R. Blais, c/o owner, engr. CD 6/30/50.

BIDS ASKED—BUILDINGS

B. C., Qualicum—SCHOOL—B.A. 8/27—James H. White, secy. treas., School Dist. 69, Qualicum, Junior-Senior High School, $400,000. Plans deposit $100. C. B. K. Van Norman, 540 Seymour St., Vancouver, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ BRITISH COLUMBIA—Province of B. C., Parliament Bldgs., Victoria, B. C.

Emil Anderson Constr. Co., Ltd., Hope, B. C., and General Constr. Co. Ltd., Granville Island, Vancouver, B. C., LB, $1,141,574, reconstr. 6.94 mi. hy., Martel-Ashcroft Manor Section, Trans-Canada Rd., LB $797,581, reconstr. 5.71 mi. hy. Savona-Cherry Creek Section, Trans-Canada Rd.

General Constr. Co., Ltd. Granville Island, Vancouver, B. C., L. B., $211,436, reconstr. 7.197 mi. hy. Progress-Arras Section, Peace River Hy. Bids July 31. CD 7/26.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ City, Lethbridge, Alta., rejected bids Mar. 30, 250-bed New Galt HOSPITAL, LETHBRIDGE, ALTA. LB, $1,894,600. Project deferred. CD 4/26, under LB.

▲ Alaska Pine & Cellulose Ltd., 355 Burrard St., Vancouver, B. C., Owner Builds, $6,000,000, modernize dissolving sulphite MILL, incl. whole log barker chipping plant, bleached pump screen room, high pressure 225,000 lb. per hr. steam boiler and major changes in mill water supply, PORT ALICE, B. C. W. A. Bain, 355 Burrard St., Vancouver, B. C., engr. Awarded July 31.

Babcock Wilcox & Goldie McCulloch, Ltd., 67 Yonge St., Toronto, Ont., CA, $801,937, design, manufacture, supply, erect steam generating unit of 280,000 lb. pressure and associated equipment for 25,000 kw. turbo-alternator, WINNIPEG, MAN. Winnipeg Hydro-Electric System, 55 Princess St., Winnipeg, Man. H. L. Briggs, c/o owner, engr. CD 10/9/50.

Eldorado Mining & Refining Co. Ltd., (Govt of Canada) Ottawa, Ont., Own Forces, $500,000 tailings MILL, PORT RADIUM, N. W. T. CD 4/3, under Industrial bldgs.

OFFICIAL PROPOSALS

APPEAR HERE EACH THURSDAY. PROPOSAL ADVERTISEMENTS ACCEPTED UP TO 10 A.M. FRIDAY FOR THE ISSUE DATED THE FOLLOWING THURSDAY.

Bids: August 29, 1951

State Highway Projects

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time on Wednesday, August 29, 1951 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. Nickerson, Dist. Engr., 358 Broadway, Albany, N. Y.				
Albany	FAS851-9	Preston Hollow-Medusa-So. Westerlo, C. R. 352 Proj. S325(1)	8.60	Asp. Conc. Ty. 1A, Opt. 21' Conc. Slab Bridge Twin Box Bridge 2 Sp. 12'-8" Ea.	$30,000 Plans $25	$506,000
		DISTRICT No. 2				
		L. Ketchum, Dist. Engr., 109 No. Genesee St., Utica, N. Y.				
Oneida	FARC51-47	Marcy Hill-Trenton, S. H. 931 Remsen-Boonville Town Line, S. H. 3346 Boonville Town Line-McKeever, S. H. 5248 Proj. F732(4), F321(6), F743(3)	7.96	Landscaping	$1,600 Plans $10	$29,000
		DISTRICT No. 4				
		A. R. Mulligan, Dist. Engr., Barge Canal Terminal, Rochester, N. Y.				
Genesee	FAC51-4 FARC51-37	Corfu-Batavia, S. H. 8283 Batavia City: Pearl St. Proj. U377(11)	0.95	Asphalt Conc. Type 2A	$16,000 Plans $15	$269,000
Genesee, Monroe & Wyoming	FARC51-48	Elba-Byron, Pts. 1 & 2, S. H. 48-14, S. H. 48-13 Attica-Batavia, Pt. 1, S. H. 8022 Attica Village, Market & Main Streets, S. H. 9224 Bridge Pts. 1, 2, 3, & 4, S. H. 6, 165, 256, 257 Proj. S235(3); F44(3), F402(7)	19.80	Landscaping	$1,000 Plans $10	$18,000
		DISTRICT No. 5				
		C. R. Waters, Dist. Engr., 65 Court St., Buffalo, N. Y.				
Cattaraugus	FAS851-16	Napoli-New Albion, C. R. 10 Proj. S798(2)	5.52	D.S. Treated Graded Gravel 48' I-Beam: 30' Conc. Slab	$17,000 Plans $15	$304,000
Chautauqua	FAS851-21	York-Allegany Co. Rd. 119 Proj. S347(1)	3.78	Bit. Mac. Ty. 1, Br. Stone or Slag	$11,000 Plans $10	$200,000
		DISTRICT No. 6				
		H. F. Brumm, Dist. Engr., 30 West Main St., Hornell, N. Y.				
Chemung	FARC51-64	Horseheads-Montour Falls, S. H. 5208 Proj. F479(9)	2.60	Asphalt Conc. Ty. 1A, Opt.	$8,000 Plans $10	$146,000
		DISTRICT No. 7				
		R. F. Hall, Dist. Engr., 444 Van Dusee St., Watertown, N. Y.				
Jefferson	FAS851-12 FARC51-13	Watertown Road (Rte. 12 to Pearl St. Rd.) Grade Separation Structure over N.Y.C. R.R.	6.77 (0.17 Acc.)	Asp. Conc. Ty. 1A, Opt. = 6.74 Mi. Cem. Conc. Pavt. = 0.03 Mi. (R.O.B. Gravel = 0.17 Mi. Access: R.R. Sep. 3 Sp. Alpha I-Beam, 163' Total Alpha Royalty = $122.00	$38,000 Plans $25	$689,000
		DISTRICT No. 9				
		F. W. Donovan, Dist. Engr., 71 Frederick St., Binghamton, N. Y.				
Otsego	FAS851-20	Otego-Oneonta. (Co. Rd.) Proj. F339(1)	6.90	Graded Gravel (Bit. Mulch)	$28,000 Plans $15	$472,000
		DISTRICT No. 10				
		J. J. Darcy, Dist. Engr., Montauk Highway at Little E. Neck Rd., Babylon, L. I., N. Y.				
Bronx & Westchester	FA BRP51-3	Bronx River Parkway, (Sto. Ext.) Proj. U979(14)	0.63 (0.61 Acc.)	8" Cem. Conc. Pavt. 2 at 34' Wide = 0.55 Mi. Asph. Conc. Ty. 1A, Opt. = 0.04 Mi. Misc. Work = 0.04 Mi. (Cem. Conc. Pavt. on Access Rds. = 0.61 Mi.)	$43,000 Plans $25	$755,000
Kings	FA BQE51-1	Brooklyn-Queens Expressway (Cont. 15) Proj. U1066(8)	0.50	Demolition of Buildings	$15,000 Plans $10	$296,000
Suffolk	FARC51-65	Bridgehampton-Devon, Pt. 1, S. H. 1495	2.39	Asph. Conc. Ty. 1A, Opt.	$8,000 Plans $10	$142,000
						$3,826,000

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

OFFICIAL PROPOSALS

Bids: September 1.

Yonge Street Subway

TORONTO TRANSPORTATION COMMISSION
CONTRACTS SC-1 and SC-2.

Sealed tenders, endorsed "Tenders for Yonge Street Subway," will be received by the Toronto Transportation Commission at its office 35 Yonge Street, Toronto, until twelve o'clock, Noon, Eastern Standard Time, on Friday, the fourteenth day of September, 1951.

Individual tenders are invited for Contracts SC-1 and SC-2 respectively.

Contract SC-1 consists of interior finish in underground stations, heating, plumbing, ventilation and electrical work together with the necessary work collateral thereto for 5 stations between Front and York Streets and Yonge and Alexander Streets, as shown on the plans and described in more detail in Requirements for Tendering and Instructions to Tenderers.

Contract SC-2 consists of station buildings, surface structures, interior finish, heating, plumbing and electrical work, together with the necessary work collateral thereto for 6 stations between Yonge and Alexander Streets and Imperial Street, as shown on the plans and described in more detail in Requirements for Tendering and Instructions to Tenderers.

All tenders must be made upon blank forms of tender as furnished by the Toronto Transportation Commission and included in the Contract Documents, and shall be made in accordance with the provisions contained in said documents.

The successful tenderer will be required to furnish, execute and deliver to the Commission a performance bond satisfactory to the Commission in the amount and within the time set out in the Contract Documents.

The Contract Documents, including plans and specifications, will be available to tenderers on July 23rd at the Rapid Transit Office of the Toronto Transportation Commission, 14 Front Street East, Toronto. Copies of the Contract Documents may be obtained by depositing One Hundred Dollars ($100.00) with the Commission for each set of documents. The amount of the deposit will be refunded upon return of the plans and documents in good condition within ten (10) calendar days after the opening of tenders.

Each tender must be accompanied by cash or a certified cheque on a chartered bank doing business in the City of Toronto, in the amount of two and one-half per cent (2½%) of the Contract price.

The Toronto Transportation Commission reserves the right to reject any or all tenders and to disregard any informalities in the tenders or tendering.

No tender may be withdrawn after the scheduled closing time for receipt of tenders for at least forty-five (45) calendar days.

Wm. C. McBrien
Chairman,
TORONTO TRANSPORTATION COMMISSION

Toronto, Ontario.

Bids: September 12, 1951

Main Sewage Treatment Plant Primary Treatment

RE-ADVERTISEMENT
City of Camden, New Jersey
GENERAL CONSTRUCTION
CONTRACT 5

Camden, New Jersey

Sealed proposals will be received by the Purchasing Board of the City of Camden, New Jersey, at the office of the Mayor, 17th Floor, City Hall, Camden, New Jersey, on September 12, 1951 at 1:30 P. M., at which time and place proposals will be publicly opened and read for:

The Main Sewage Treatment Plant, Primary Treatment; General Construction, Contract 5.

Copies of the plans and specifications and blank proposals may be examined at the office of the City Engineer, City Hall, Camden, New Jersey, or at the office of Havens and Emerson, Room 1414, Woolworth Building, 233 Broadway, New York 7, New York, after August 13, 1951.

Plans, Specifications and Proposal Form may be obtained at the office of Havens and Emerson, Room 1414, Woolworth Building, 233 Broadway, New York 7, New York. A deposit of fifty dollars will be required for each set of plans and specifications taken from the above office. The entire deposit will be refunded if a formal bids is submitted to the City and the plans and specifications are returned in good condition on or before September 26, 1951. After that date no plans or specifications will be redeemed and the entire deposit shall be forfeited. Where no bid is submitted and the plans and specifications are returned on or before the date hereinbefore specified, only one-half the entire deposit shall be returned. Contractors, equipment manufacturers and materialmen who have returned plans and specifications from the previous advertisement and obtained plans and specifications under this re-advertisement will receive full refund of their new deposit on proper return of said plans and specifications.

Extra copies of specifications may be obtained at the cost of fifteen dollars each and extra sets of plans may be obtained at the cost of thirty-five dollars each, which sums will not be refunded. Extra sheets may be obtained at the cost of one dollar each which sum will not be refunded.

Each bid must be accompanied by cash, certified or cashier's check to the order of the City of Camden in an amount equal to five percentum of the amount of the bid but not to exceed one hundred thousand dollars, and a bid letter from a surety company licensed to conduct business in New Jersey engaging to furnish a completion bond upon the contract's award.

Each bid must be made upon the blanks furnished with the contract, drawings and specifications, and in case of corporations not chartered in New Jersey, must be accompanied by proper certificate that such corporation is authorized to do business in New Jersey.

The Board reserves the right to reject any and all bids, to waive any defects or informalities in the bids received, and to accept any bid which is deemed most favorable to the City of Camden, New Jersey, at the time and under the circumstances stipulated.

Bids will not be received before or after the time specified for the opening of the bids. Bids submitted before the hour appointed, or thereafter, will be deemed invalid and returned unopened to the bidder.

PAULINE F. ULMER,
Secretary, Purchasing
Board of the City of
Camden, New Jersey

Dated: August 13, 1951
P. O. 9644

Bids: September 11, 1951

Heating and Ventilating Equipment

CONTRACT 327

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 10:00 A.M., Eastern Standard Time, on Tuesday, September 11, 1951, for Contract 327, for furnishing, delivering, installing and testing heating, ventilating and appurtenant equipment for the Rondout, West Branch and Kensico South effluent chambers, and heating equipment with appurtenances for the drainage chamber at Shaft 13, the coagulating plant at Shafts 17 and the Kensico comfort station, and for performing appurtenant miscellaneous construction, all as set forth in the specifications. The locations of the proposed work are in the Towns of Wawarsing, Ulster county, Carmel, Putnam county and Bedford, North Castle and Mount Pleasant, Westchester County, New York.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York, in the amount of ten thousand dollars ($10,000.00) for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety etc., can be obtained in Room 1311, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, RUFUS E. McGAHEN, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

Bids: August 30, 1951

Route Construction

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner:

ROUTE 4 PARKWAY, SECTION 7C
Construction of Route 4 Parkway, Section 7C, Superstructure of Viaduct over South Avenue; Staten Island Rapid Transit Railway Co.; Central Railroad of New Jersey; and North Avenue (Route 29); in Cranford Township, Union County, Federal Project No. U-188(22). The principal items of construction are:

Estimated:
2,216 cu. yds. Concrete in Structures
517,600 lbs. Reinforcement Steel in Structures
3,473,000 lbs. Structural Steel
2,682 sq. ft. Random Ashlar Masonry
1,530 lin. ft. Metal Railing

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Ave., Trenton, N. J., on Thursday, August 30, 1951, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 23 of the Revised Statutes of New Jersey and supplements and by Section 1, P. L. 834th Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 268 North Broad Street, Elizabeth, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the Standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

OFFICIAL PROPOSAL

RATE: $1.25 per line (or fraction) per insertion.
CLOSING DATE: 12:00 p.m. Thursday for issue out following Thursday.
SEND COPY: Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

OFFICIAL PROPOSALS

Bids: Sept. 18, 1951

Goulburn Irrigation System

STATE RIVERS AND WATER SUPPLY COMMISSION, VICTORIA, AUSTRALIA

TENDERS are invited from organizations experienced in the construction of large civil engineering works for the WARANGA WESTERN MAIN CHANNEL ENLARGEMENT (First Stage) between Waranga Reservoir and the Campaspe River, a distance of 41 miles.

The construction includes the following main items:

PART A:

Approximately 10,000,000 cubic yards of earthwork, miscellaneous minor drainage works, road deviations and fencing.

PART B:

Regulating structures, including control equipment, major cross-drainage works and some 50 road and railway bridges. Approximately 30,000 cubic yards of reinforced concrete are involved in these structures.

Tenders may be submitted for the whole of the work or for either Part A or Part B. Tenders for Part A are invited for a "Schedule of Rates" (unit price) contract. Tenders for Part B are to include DETAILED DESIGN and may be either on a "Schedule of Rates" or "Cost Plus Fixed Fees" basis.

EXHIBITION DOCUMENTS comprising CONDITIONS OF TENDERING, GENERAL CONDITIONS OF CONTRACT, AND SPECIFICATIONS AND PLANS, together with general information concerning some prevailing wage rates and employment conditions in Victoria, are available at £A10, per set, and will be forwarded to bona-fide prospective tenderers on receipt of written applications, enclosing cheque, addressed to:

The Secretary,
State Rivers and Water Supply Commission,
100-110 Exhibition Street,
MELBOURNE, C1,
Victoria, Australia.

or

The Agent-General for Victoria,
Melbourne Place,
Strand,
LONDON, W. C. 2.

Tenders endorsed:—

"TENDER FOR WARANGA WESTERN MAIN CHANNEL ENLARGEMENT (FIRST STAGE)"

will be received by the Secretary, State Rivers and Water Supply Commission, at 100 Exhibition Street, Melbourne, until 12 NOON on 18th September, 1951. A preliminary deposit, payable at Melbourne of £A200, for Part A and £A100 for Part B must be lodged with the Tender. Such preliminary deposit will subsequently be refunded to unsuccessful Tenderers.

Lowest or any Tender not necessarily accepted.

Bids: Sept. 5, 1951

State Police Barracks

Notice is hereby given that sealed proposals will be received in the office of the Director, Division of Purchase and Property, Room 318, State House, Trenton 7, New Jersey, for the following:

General, plumbing, heating and ventilating, electric, structural steel and miscellaneous iron work in connection with new State Police Barracks at Princeton, New Jersey

and

General, plumbing, heating and ventilating, electric, structural steel and miscellaneous iron work in connection with new State Police Barracks at Bordentown, New Jersey

Bids for the above will be received at the office of the Director, Division of Purchase and Property, State House, W. State St., Trenton 7, New Jersey on Wednesday, September 5, 1951 at one (1:00) o'clock, E.S.T. and will be opened and read immediately thereafter.

Bids must be made on the standard proposal form, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than 5% of the amount of the bid, such, in the amount of 5% of the bid or a bid bond in the amount of 5% of the bid, and must be delivered at the above place on or before the hour named, as no bid will be accepted after the hour specified. Bids not submitted on the standard proposal form or enclosed in other than special addressed envelopes will be considered informal and will be rejected. The Director reserves the right to reject any and all bids and to award contract in part or whole if deemed to the best interests of the State to do so. The successful bidder will be required to qualify for surety bond in the full amount of the contract, of a company authorized to do business in the State of New Jersey.

Plans and specifications, form of bid, contract and bond for the proposed work are on file and may be obtained upon application to the Director, Division of Purchase and Property, State House, Trenton, New Jersey on deposit of twenty-five dollars ($25.00) for each set; this amount to be refunded to the bidder upon receipt of same in good condition within 30 days after the award of the contract.

DEPARTMENT OF THE TREASURY
STATE OFFICE BUILDING
AUTHORITY.
Walter T. Margetts, Jr.
Chairman.

Bids: Sept. 11, 1951

Additions to Sewage Treatment Plant

Gettysburg Municipal Authority, Borough of Gettysburg, Adams County, Pennsylvania

Sealed proopsals will be received at the Gettysburg Municipal Authority Office, 141 Baltimore Street, Gettysburg, Pennsylvania, until 2:00 P.M., E.D.S.T., Tuesday, September 11, 1951 for furnishing all necessary labor, materials and equipment, and performing all work for the construction of ADDITIONS TO A SEWAGE TREATMENT PLANT, and will be publicly opened and read immediately thereafter in the Borough Council Chamber at the Fire Engine House on East Middle Street, Gettysburg, Pa. Separate proposals will be received upon four parts of the project as follows:

Contract One—General Construction: Including Diversion Chamber, Grit Channel and Comminutor Structure; Control Building; Primary Settling Tanks; Primary Biofilter; Lift Pumping Station; Secondary Biofilter Final Settling Tanks; Sludge Digester; Sludge Drying Beds; Sludge Pumping Station; Inter-Unit Piping; Road and Walks; Fencing; Specified Equipment and Appurtenances.

Contract Two—Plumbing Work: Including Domestic and Plant Water Systems, Plumbing, Domestic Indirect Water Heater and Storage Tank, Insulation, Plumbing Fixtures, Pneumatic Water System and Compressed Air System.

Contract Three—Heating Work: Including Insulation, Combination Gas and Oil Fired Boiler, Digester Circulating Water Heating System, Digester Gas System, Combustion Control System for Gas and Oil, Underground Fuel Oil Storage Tank System, and Ventilating Fans.

Contract Four—Electrical Work: Including Underground Service Feeder, Control Center, Power Distribution, Outside Underground Distribution System, Outside Lighting System, Building Lighting System, Removal of All Existing Electrical Wires, etc.

Proposals shall be accompanied by certified checks or satisfactory bidder's bonds in accordance with provisions contained in the Specifications and in amount not less than ten (10) per cent of the bid total.

Copies of the Contract Documents, including Plans and Specifications, may be seen at the office of Gannett Fleming Corddry and Carpenter, Inc., 600 North Second Street, Harrisburg, Pennsylvania, or at the office of the Gettysburg Municipal Authority, 141 Baltimore Street, Gettysburg, Pennsylvania; or they may be obtained from the first of the above stated places upon deposit of the following amounts for each set:

Contract One—General Construction—	$15.00
Contract Two—Plumbing Work—	$10.00
Contract Three—Heating Work—	$10.00
Contract Four—Electrical Work—	$10.00

Full refund will be made to actual bidders for return of one of each set in good condition within ten (10) days after closing date for receipt of bids; refund for return of all other sets, in good condition within the same periods, will be fifty (50) per cent of the deposit.

Gettysburg Municipal Authority
Borough of Gettysburg,
Pennsylvania

Gannett Fleming Coddry & Carpenter, Inc., Engrs.
600 N. Second Street
Harrisburg, Pennsylvania

Bids: August 28, 1951

Road Construction

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 25, SECTION 9A

Construction of Route 25, Section 9A, from Pennsauken Creek to Haddonfield Road, Widening and Ramps to Route S-41, Cinnaminson Township, Burlington County, Pennsauken Township, Camden County, Federal Project No. U-69(16). Length 0.370 mile.

Estimated:

31,055	cu. yds. Roadway Excavation—Earth
5,591	cu.yds. Channel & Wet Excavation
10,185	sq. yds. Waterbound Macadam Base Course
1,204	tons Bituminous Concrete Pavement
6,031	sq. yds. 9" R. C. Pavement Surface
2,608	lin. ft. 15" to 36" R. C. Culvert Pipe
20	units Manholes and Inlets
13,539	lin. ft. White Concrete Curb
	Electrical Sign System
	Demolition of Buildings

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Ave., Trenton, N. J., on Tuesday, August 28, 1951, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P. L. 769, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 538 Broadway, Camden, N. J. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $1.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-3518) will be received by the Bureau of Reclamation, Denver, Colorado, until September 13, 1951, and then publicly opened for furnishing two 84-inch butterfly valves with operating units and handling equipment for Colorado-Big Thompson Project, Colorado. Delivery is desired within 365 days. For particulars, address Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-3511) will be received by the Bureau of Reclamation, Denver, Colorado, until September 11, 1951, and then publicly opened for furnishing three 15-foot 6-inch diameter penstocks for Central Valley Project, California. Delivery is desired within 510 days. For particulars, address Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

OFFICIAL PROPOSALS

Bids: September 5, 1951

Lincoln Tunnel Third Tube

THE PORT OF NEW YORK AUTHORITY
MANUFACTURE, STORAGE AND DELIVERY OF CAST IRON AND CAST STEEL TUNNEL LINING
CONTRACT LT-160.001

Sealed proposals for the manufacture, storage and delivery of cast iron and cast steel tunnel lining for the Third Tube of the Lincoln Tunnel will be received at the office of the Chief Engineer of The Port of New York Authority Room 1100, 111 8th Ave., New York 11, until 11:30 A. M. Wednesday, September 5, 1951, at which latter time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $25 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman.

New York, August 16, 1951.

Bids: September 11, 1951

Postponement of Bid Date Conical Plug Valves, Etc. Contract 412

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 10:00 A.M., Eastern Standard Time, on Tuesday, August 21, 1951, for Contract 412, for furnishing, testing and delivering eight 48-inch and two 36-inch cast steel motor-operated conical plug valves, two 42-inch, two 24-inch and one 12-inch cast iron motor-operated conical plug valves, one 14-inch cast iron manually-operated conical plug valve, one 20-inch cast iron motor-operated gate valve, pipe couplings and miscellaneous valves for installation in the intake and outlet chambers of the Neversink tunnel, the Downsville release water chamber and the outlet chamber of the East Delaware tunnel of the Delaware aqueduct, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York in the amount of thirty-five thousand dollars ($35,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information, specifications, forms of bid and contract, specifications, requirements as to surety, etc., can be obtained in Room 1311, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, RUFUS E. McGAHEN, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

NOTICE TO BIDDERS

NOTICE IS HEREBY GIVEN that the receipt and opening of bids on the above Contract 412 have been postponed until 10:00 A.M., Eastern Standard Time, on Tuesday, September 11, 1951.

IRVING V. A. HUIE, President, RUFUS E. McGAHEN, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

Bids: August 24, 1951

Water Tank and Tower

Notice is hereby given that sealed proposals will be received in the office of the Director, Division of Purchase and Property, Room 318, State House, Trenton 7, New Jersey, for the following:

Construction and erection of one four hundred thousand (400,000) gallon double ellipsoidal steel water tank and tower, including foundations and accessories, at the Fourth Mental Hospital, Ancora, Winslow township, New Jersey.

Bids for the above will be received at the office of the Director, Division of Purchase and Property, State House, W. State St., Trenton 7, New Jersey on Friday, August 24, 1951 at one (1:00) o'clock, E.S.T. and will be opened and read immediately thereafter.

Bids must be made on the standard proposal form, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than 5% of the amount of the bid, cash, in the amount of 5% of the bid or a bid bond in the amount of 5% of the bid, and must be delivered at the above place on or before the hour named, as no bid will be accepted after the hour specified. Bids not submitted on the standard proposal form or enclosed in other than special addressed envelopes will be considered informal and will be rejected. The Director reserves the right to reject any and all bids and to award contract in part or whole if deemed to the best interests of the State to do so. The successful bidder will be required to qualify for surety bond in the full amount of the contract, of a company authorized to do business in the State of New Jersey.

Plans and specifications, form of bid, contract and bond for the proposed work are on file and may be obtained upon application to the Director, Division of Purchase and Property, State House, Trenton, New Jersey on deposit of twenty-five dollars ($25.00) for each set; this amount to be refunded to the bidder upon receipt of same in good condition within 30 days after the award of the contract.

DEPARTMENT OF THE TREASURY
Division of Purchase and Property
Fred V. Ferber, Director

Bids: August 28, 1951

Bloomfield Avenue

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Construction of Bloomfield Avenue from Broadway to Lake Street, in the City of Newark, Essex County, Federal Aid Secondary Project No. S-126(1). Length 0.742 mile.

Estimated:
22,172 cu. yds. Roadway Excavation
7,540 cu. yds. Subbase
34,443 sq. yds. 8" Concrete Base
5,620 tons Bituminous Concrete
5,122 lin. ft. Rein.Conc. Pipe
124 units Catch Basins & Manholes
14,554 lin. ft. Granite & Concrete Curb
8,240 sq. yds. Concrete Sidewalk

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, August 28, 1951, at 11:00 o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the prequalificatoin of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Secondary Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements, and by P. L. 769, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 309 Washington Street, Newark, N. J. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids. Signed: R. J. Abbott
State Highway Commissioner

Bids: August 29, 1951

SEWAGE FORCE MAIN AND SEWAGE TREATMENT PLANT

SEALED BIDS will be received by the DOVER SEWERAGE AUTHORITY at the Township Committee Chambers, New Town Hall, 33 Washington Street, Toms River, New Jersey, at 8:00 o'clock, P.M., on the twenty ninth day of August, 1951, for the construction, under two contracts, of a SEWAGE FORCE MAIN and a SEWAGE TREATMENT PLANT, at which time and place they will be publicly opened, read and considered. Bids may be submitted on either or both of the following divisions of the work:

CONTRACT NO. 1—SEWAGE FORCE MAIN comprising approximately 2500 feet of 12 inch main, valve and meter housing, connection to present pumping station and Imhoff tank, valves and appurtenances.

CONTRACT NO. 2—SEWAGE TREATMENT PLANT having a capacity of 350,000 g.p.d. and comprising 2 Imhoff tanks, dosage tank, intermittent sand filters, sterilization and contact chamber, influent and effluent lines, machinery and equipment, housings and appurtenances.

Full information may be had at the office of the Dover Sewerage Authority Toms River, New Jersey, and at the office of Earl E. Sousley, Engineer, Hyers Streets, Toms River, New Jersey. Plans, specifications, proposals and other contract documents may be obtained upon the payment of $10.00 for each set for either contract, which payment will be refunded upon the submission of a sealed bid and the return of the plans and specifications in good condition. The right is reserved to reject any and all bids.

DOVER SEWERAGE AUTHORITY
Joseph A. Citta, Chairman
Robert D. Conti, Secretary

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3514) will be received by Bureau of Reclamation, Ephrata, Washington, until September 18, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of Babcock Pumping Plant and lateral W35.9, area W-8, West Canal laterals, Columbia Basin Project, Washington. The work is situated approximately 3 miles southwest of Quincy, Washington. Principal items are approximately: 140,000 cu. yds., excavation; 1,700 cu. yds., concrete; 270,000 lbs., structural steel and metalwork; 9,700 lin. ft., 42- to 54-inch concrete discharge lines; installing 10 pumping units and appurtenant equipment; and other work. Time allowed for completion will be 705 days. For particulars, address Bureau of Reclamation, Ephrata, Washington; or Building 1-A, Denver Center, Denver, Colorado.

Read the Official Proposal Columns of ENGINEERING NEWS-RECORD This Week and Every Week

OFFICIAL PROPOSALS

Bids: September 12, 1951

Ramapo Pumping Station and Others

Wanaque Headworks
Wanaque, New Jersey

Sealed proposals will be received from 2:00 P.M. to 2:10 P.M., Eastern Daylight Saving Time, on September 12, 1951 by the North Jersey District Water Supply Commission in its office, Wanaque Headworks, Wanaque, New Jersey, and publicly opened and read at the last named hour for the performance of all the necessary work required under the following contracts:

RAMAPO PUMPING STATION

Contract 57. Pumps, Motors, Piping etc.

Furnish and install bar screens, sluice gates, screen chamber equipment, 78-inch steel penstock, 72-inch steel header, piping, 25 MGD pumps, 700 H.P. synchronous motors, 7½ ton traveling crane, gate and cone valves, etc.

Contract 58. Electrical Work

Furnish and install 3000 KVA 3 phase sub-station, main switchboard for control of main line and all other items including motor control, panels, 100 KVA engine-driven generator, all power, lighting and control wiring both interior and exterior to the Pumping Station, lighting fixtures, including exterior lighting standards and flood lights, etc.

Contract 63. Heating and Ventilating Work

Furnish and install complete heating, ventilating and control of same for the Pumping Station Building, including unit type, oil-fired boiler, vacuum heating system, radiation, heating units, etc.

Contract 64. Plumbing and Drainage Work

Furnish and install complete sanitary and storm drainage facilities, including fixtures and piping, septic tank, leaching field, inside leaders, roof and other drains, etc.

Contract 65. General Engineering Construction

Includes removal of plain and reinforced concrete work, removal of present concrete penstocks; coffer dam maintenance, foundations for new penstock, etc., repairs to existing forebay, gunite work, new plain and reinforced concrete work, backfilling, etc.

Contract 69. Engineering steel and Miscellaneous steel and metal

Includes removal of existing steel framing in top of forebay over old timber gate, removal of existing wire fence, etc., furnishing and installing new wire fencing, etc., furnishing and installing manhole frames and covers, grating frames and covers, etc.

RAMAPO TREATMENT PLANT

Contract 72. Mechanical Equipment

Furnish and install lime, ammonia, copper sulphate and chlorine equipment, dust collectors, air compressors, water and other fluid pumps, special piping, pitot tubes, etc.

Contract 73. Electrical Work

Furnish and install electrical service, telephone conduit, all power, light and control wiring, panels, lighting fixtures, freight elevator, overhead electric hoist, yard derrick, engine driven generator, emergency lighting system, etc.

Contract 74. Heating and Ventilating Work

Furnish and install complete heating, ventilating and control of same, including unit type, oil-fired boiler, vacuum heating system, radiation, heating units, etc.

Contract 75. Plumbing and Drainage Work

Furnish and install complete sanitary and storm drainage facilities, including fixtures and piping, septic tank, leaching field, inside leaders, roof and other drains, etc.

Form of proposal, form of contract, specifications and drawings may be examined in the office of the Commission or may be obtained at the said office upon deposit of $35.00 per set. The full amount of deposit will be refunded to persons or firms submitting a bid when plans are returned, and all other deposits will be returned, (less $20.00, which is the actual cost of the documents) upon return of plans and specifications in good condition within thirty days after the date of opening of bids.

All bids shall be made on the blank form supplied by the Commission, which provides for a detailed statement as to the bidders experience and resources as well as the price for which he will execute the work.

Each proposal must be accompanied by a consent in writing of a surety company qualified to do business in New Jersey, binding itself to indemnify the Commission against any losses due to the failure of the person or persons making said proposal to properly execute the contract in case it be awarded to him or them, and binding itself that if the contract be so awarded the said surety company will become surety for the full and faithful performance of the same in an amount equal to 100 per cent of the contract price and, through an additional obligation, will also become surety in the sum of 100 per cent of the contract price, for the protection of all persons furnishing materials or labor for the construction of this contract in accordance with Revised Statutes of New Jersey 2:60-207 to 211 inclusive.

CERTIFIED CHECK

No bid will be considered unless accompanied by a certified check upon a National or State Bank or Trust Company, drawn and made payable to the order of the North Jersey District Water Supply Commission in the following amounts:

Ramapo Pumping Station

Contract #57—Pumps, Motors, Piping, Etc. Twenty thousand dollars ($20,000.00)

Contract #58—Electrical Work Seven thousand, five hundred dollars ($7,500.00)

Contract #63—Heating & Ventilating Work One thousand dollars ($1,000.00)

Contract #64—Plumbing & Drainage Work Five hundred dollars ($500.00)

Contract #65—General Engineering Construction Seven thousand dollars ($7,000.00)

Contract #69—Engineering Steel & Miscellaneous Steel & Metal Two hundred fifty dollars ($250.00)

Ramapo Treatment Plant

Contract #72—Mechanical Equipment Six thousand, five hundred dollars ($6,500.00)

Contract #73—Electrical Work Two thousand dollars ($2,000.00)

Contract #74—Heating & Ventilating Work Nine hundred dollars ($900.00)

Contract #75—Plumbing & Drainage Work Two hundred dollars ($200.00)

as a guarantee.

The Commission reserves the right to accept any bid deemed advantageous or to reject all proposals or any proposal which may be informal, the acceptance of which, in the judgment of the Commission for the reasons as suggested in information for bidders or for any other reason, would be detrimental to the interest of the municipalities for which the work is to be done.

By order of the North Jersey District Water Supply Commission of the State of New Jersey.

WILLIAM P. FURREY, Chairman
Attest: George V. McDonough, Secretary

OFFICIAL PROPOSALS

Bids: September 12, 1951

Pumping Station and Treatment Plant

Wanaque Headworks
Wanaque, New Jersey

Sealed proposals will be received from 11:00 A.M. to 11:10 A.M., Daylight Saving Time, on September 12, 1951 by the North Jersey District Water Supply Commission in its office, Wanaque Headworks, Wanaque, New Jersey, and publicly opened and read at the last named hour for the performance of all the necessary work required in connection with the following contracts:

Pumping Station—Contract No. 56—General Construction Work

Pumping Station—Contract No. 66—Steel and Miscellaneous Metal Work

Treatment Plant—Contract No. 70—General Construction Work

Treatment Plant—Contract No. 71—Miscellaneous Metal Work

The work included in Contract No. 56 consists of a Pumping Station building of steel frame and masonry walls, approximately 50 feet by 105 feet in area, with basement and mezzanine floor and a one story Screen House building, approximately 24 feet by 36 feet in area, and the demolition of certain existing structures.

The work included in Contract No. 66 consists of steel and miscellaneous metal work in connection with the buildings and appurtenances in Contract No. 56 noted above.

The work included in Contract No. 70 consists of a Treatment Plant building of concrete frame and masonry walls, approximately 49 feet by 85 feet in area with basement, first and second stories and including loading platform, hoist shed, railroad siding, roadway and paving.

The work included in Contract No. 71 consists of miscellaneous metal work in connection with the buildings and appurtenances in Contract No. 70, noted above.

Form of proposals, form of contracts, specifications and drawings may be examined in the office of the Commission or may be obtained at the said office upon deposit of $35.00 per set. The full amount of deposit will be refunded to persons or firms submitting a bid, and all other deposits will be returned, (less $20.00, which is the actual cost of the documents) upon return of plans and specifications in good condition within thirty days after the date of opening of bids.

All bids shall be made on the blank forms supplied by the Commission, which provides for a detailed statement as to the bidder's experience and resources as well as any other necessary data as may be requested.

Each proposal must be accompanied by an agreement in writing of a surety company qualified to do business in New Jersey, binding itself to indemnify the Commission against any losses due to the failure of the person or persons making said proposal to properly execute the contract in case it be awarded to him or them, binding itself that if the contract be so awarded the said surety company will become surety for the full and faithful performance of the same in an amount equal to 100 percent of the contract price and, through an additional obligation, will also become surety in the sum of 100 percent of the contract price, for the protection of all persons furnishing materials or labor for the construction of this contract in accordance with Revised Statutes of New Jersey 2:60-207 to 211 inclusive.

Each bid must be accompanied by a certified check as a guarantee in the following amount, according to the contract bid:

Contract 56—$20,000.		
"	66—$ 2,000.	
"	70—$20,000.	
"	71—$ 300.	

Checks of unsuccessful bidders will be returned within 30 days and that of the successful bidder upon the execution of the contract and bonds.

The Commission reserves the right to accept any bid deemed advantageous or to reject all proposals or any proposal which may be informal, the acceptance of which, in the judgment of the Commission for the reasons as suggested in information for bidders or for any other reason, would be detrimental to the interest of the municipalities for which the work is to be done.

By order of the North Jersey District Water Supply Commission of the State of New Jersey.

WILLIAM P. FURREY, Chairman
Attest: George V. McDonough, Secretary.

OFFICIAL PROPOSALS

Bids: August 21, 1951

State Hospital Work

Notice is hereby given that sealed proposals will be received in the office of the Director, Division of Purchase and Property, Room 318, State House, Trenton 7, New Jersey, for the following:

General work, structural and miscellaneous iron work, plumbing, heating and ventilation, electrical work and elevator for Senile Building at the New Jersey State Hospital at Marlboro, New Jersey.

Bids for the above will be received at the office of the Director, Division of Purchase and Property, State House, W. State St., Trenton 7, New Jersey on Tuesday, August 21, 1951 at one (1:00) o'clock, eastern standard time and will be opened and read immediately thereafter. Bids must be made on the standard proposal form, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than 5% of the amount of the bid, cash, in the amount of 5% of the bid or a bid bond in the amount of 5% of the bid, and must be delivered at the above place on or before the hour named, as no bid will be accepted after the hour specified. Bids not submitted on the standard proposal form or enclosed in other than special addressed envelopes will be considered informal and will be rejected. The Director reserves the right to reject any and all bids and to award contract in part or whole if deemed to the best interests of the State to do so. The successful bidder will be required to qualify for surety bond in the full amount of the contract of a company authorized to do business in the State of New Jersey.

Plans and specifications, form of bid, contract and bond for the proposed work are on file and may be obtained upon application to the Director, Division of Purchase and Property, State House, Trenton, New Jersey on deposit of twenty-five dollars ($25.00) for each set; this amount to be refunded to the bidder upon receipt of same in good condition within 30 days after the award of the contract.

DEPARTMENT OF THE TREASURY
Division of Purchase and Property
Fred V. Ferber, Director

(Continued on page 130)

SEARCHLIGHT SECTION

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$1.50 cents a line, minimum 3 lines. To figure advance payment count 5 average words as a line.
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The advertising rate is $14.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

NEW ADVERTISEMENTS received by August 20th at the New York City Office, 330 W. 42 St., N. Y. 18, will appear in August 30th issue subject to space available.

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HYDROELECTRIC DESIGN

Headquarters Western United States. Splendid opportunity. Graduate Mechanical or Civil Engineer with minimum 10 yrs. experience on major hydroelectric projects designing dams, penstocks, power houses, and transmission lines. Compensation commensurate with ability. Please write furnishing complete chronological experience record and salary history. Also full details regarding education, age, salary expected, business and character references, etc.

P-1566, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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Experienced in batch plant or site control of concrete, compaction control of earth fill and plant inspection of asphalt paving. Projects in Midwest, South & East. Write to

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On Sewage, Water, Highway and Traffic Projects
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Unusual opportunity for competent, experienced Superintendent. Must be aggressive and cost-conscious. Write promptly detailed account of experience, with special emphasis on reinforced concrete frame structures. Salary open.

P-1291, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

DESIGNERS, DRAFTSMEN, ELECTRICAL - MECHANICAL - STRUCTURAL. JOB LOCATED IN MIDDLE WEST. EXCELLENT WORKING CONDITIONS. GOOD SALARY. OLD ESTABLISHED COMPANY.

P-9872, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED—GRADUATED civil or structural engineer as field representative, Ohio, by long established engineering, promotional and educational organization. Give resume of education, engineering experience and salary requirements. Prefer age 25-45. P-1418, Engineering News-Record

STRUCTURAL STEEL Detail Draftsmen and Checkers. All types of Structures. Vacation, group insurance, good working conditions. Only top quality men. Send complete written information. Bristol Steel & Iron Works, Inc., Bristol, Virginia-Tennessee.

PROFESSOR OF MECHANICAL Engineering wanted, M.E. with Master's degree plus power plant experience to be head of Mechanical Engineering Department. Salary $5700 on 9 months' basis. Send applications to Professor E. L. Lium, University of North Dakota, Grand Forks, North Dakota.

STRUCTURAL DESIGNERS and Draftsman—Wanted. Good opportunity for men with ability and progressive attitude. Submit example of computations and/or drafting. L. G. Farrant, 908 Langford Bldg., Miami, Fla.

SANITARY ENGINEER wanted by established manufacturer of sewage treatment equipment. Must be experienced in actual design of sewage treatment plants. Position may offer opportunity in sales. Chicago area location. In reply give age, education, salary requirements. Write P-1575, Engineering News-Record.

ASSISTANT PROFESSOR, with industrial experience in building design and construction; teach steel and concrete design to architectural and civil engineering students. Position starts September 15, 1951; ten or twelve months employment as preferred. Midwestern engineering college—fully accredited. Salary open. P-1585, Engineering News-Record.

ESTIMATOR-BUILDING Construction: Substantial general contractor in Southern California needs experienced man to head-up estimating. Salary open. Write complete qualifications. P-1601, Engineering News-Record.

STRUCTURAL DESIGNERS and Draftsmen for indeterminate Reinforced Concrete and Steel structures, and Architectural designers and Specification Writer wanted by Baltimore consultant. Good salaries, paid overtime and vacations. State education, detailed experience, tentative reporting date and salary requirements in first letter. Reply P-1613, Engineering News-Record.

CONSTRUCTION ENGINEER—Unusual opportunity to grow in contracting for two young engineers with few years experience in building construction. Location Los Angeles. Give education, experience, salary, etc. P-1605, Engineering News-Record.

ESTIMATOR — THOROUGHLY familiar with quantity survey work on large building construction projects. One accustomed to taking off quantities for Carpentry, Concrete, Forms, Brickwork, Partitions, Excavation, Etc. Advise in confidence, experience, when available, Salary desired, age. Fleisher Engineering & Construction Co., 936 Ellicott Square, Buffalo 3, N. Y.

(Continued on page 124)

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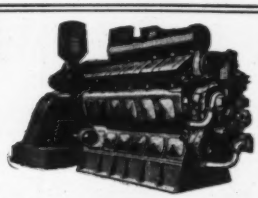

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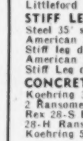

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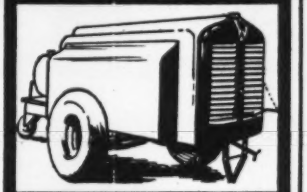

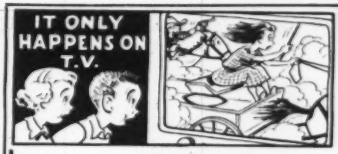

In real life the heroine in the buckboard doesn't outdistance the villain on horseback. Neither does the poorly equipped contractor outdistance the one who has plenty of MODERN Equipment from E. C. A.

AIR COMPRESSORS

Portable—2-Stage

1—315 Ing. Rand Mdl. 370-A-100, 4 cyl. Mdl. 4-115-LA gas eng. Waukesha. 4 steel wheels. Good condition. $2,500.

1—210 CFM Chicago Pneumatic #34298, 6 cyl. Hercules gas engine. $2,400.00.

2—160' Schramm #160048, 160056, 4 cyl. Buda gas engines. $1,500.00 each.

ABOVE ONLY PARTIAL LIST—WRITE FOR COMPLETE LIST.

BINS

1—100 ton Blaw Knox Model P-3100 3 compt. batch bin. With 1½ yd. #63B weigh batcher. For rental only. $425.00 per month.

1—21 ton C. M. C. 2-compartment bin with 26 cu. ft. sliding weigh-batcher. Excellent condition. Price $1,350.00.

CRANES, CRAWLER

1—1½ yd. Lorain Mdl. 77 #9163 with 45' boom and center sections to make 80' with 20' job. D13000 Cat. Diesel engine. Wt. 80000#. $20,000.00.

2—1 yd. Northwest Mdl. 4 #344, 3493, 40-60' booms, high gantry, 15' jib. Mdl. KS Wisconsin gas engines. Wt. 74,400#. $11,000.00 each.

TRENCHING MACHINES—Crawler Mounted

1—Parsons Mdl. 200 Trencher. Ser. 1774, gas powered, wheel type. Will dig 21" wide 5'6" deep. 1947 model. $6,500.00.

1—Buckeye trencher. Mdl. 12. Ser. 12, mf'd new 1946, gas powered, wheel type. Will dig 24" wide, 5'6" deep. $6,500.00.

1—Badger ladder type trencher. Mdl. 203. Ser. M39. mfd. new 1947, gas powered. Max. width 24", depth 9'6". $6,000.00.

HOIST—SPECIALS

4—Mdl. 75-3E. 3/drum American Hoists, power 75 HP Fairbanks Morse electric motors. 3/60/220/440, with grids & control equipment. $6,000.00 each.

4—Mdl. 100-2D. 2/drum American Hoists, power 109 HP Waukesha gas engine. Mdl. 145-GKU. $5,500.00 each.

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Partial List Only—Send for Stock List—We Buy, Sell and Rent

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1155 So. Washtenaw Ave. CHICAGO 12, ILL. Phone NE vada 8-2400
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P. O. Box 933-J PITTSBURGH 30, PA. Phone Federal 1-2000

EQUIPMENT CORPORATION of AMERICA

Super "C" Tournapulls

5 for immediate delivery. 4 with Cummins engines, 1 with Hercules. Write, wire, visit.

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54th & Lancaster Ave. • Phila. 31, Pa.

Pile Driving Equipment

Vulcan and McKiernan-Terry
Steam Pile Hammers and Extractors
Pile Driving Accessories
Drop Pile Hammers and Caps
Steel Sheet Piling

CONTRACTORS MACHINERY Co.
2637 Southwest Blvd. Kansas City 8, Mo.
Phone Valentine 4740

FOR SALE

25 ton Browning loco. crane new 1942
35 ton Ind. Brownhoist gas loco. crane
Two Colby 50 ton gantry cranes
Manitowoc 2000 crane 1½ yd. 80 ft. bm.
1½ Blaw Knox clamshell bucket new
8¼x10 Clyde 3 drum steam hoists new
Rex 160 single pumpcrete new 1949
Bay City 20 ton truck crane new 1949
60 HP American 3 drum gas hoist

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St. St. Louis 1, Mo.

LOCOMOTIVES

Plymouth—25 Ton—gas—Std. Ga. Excellent.
2—Whitcomb 15 Ton—Std. Ga., Gas.
2—Whitcomb 15 Ton, 36" Ga—Diesel.
Brookville—10 Ton Diesel—30" Ga.—Used 900 Hrs.
1—Brookville—12 Ton—Gas—Std. Ga.
1—Brookville—15 Ton—Gas—Stdy.—Ga.

LOCOMOTIVE CRANES

1—Ohio—30 Ton Coal Fired, Excellent.
1—Ohio—30 Ton—Gasoline—Good.

MISCELLANEOUS

2—50 Ton Hopper Cars—Excellent.
26—Hopper Cars—15 Ton—36" Ga.

Burro Mod. 210 Loco. Crane—Gas—2½ Ton—30' Boom.

American R-15 Revolver—440-3-60.

R. H. BOYER
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Phone Sagamore 2-7132

BRIDGE FOR SALE

Railroad Plate Girder Bridge now in use as Highway Bridge with temporary timber foot bridge for pedestrians on outside of one girder. Overall length 106'. Roadway width 11'. Clear width between girders at top 15'. Loading E40 at 18,000 pounds. Located Sault. Ste. Marie, Michigan. Available for shipment, September, 1951.

THE TULLER CONSTRUCTION CO.
RED BANK, NEW JERSEY

NEW and REBUILT
STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Ton — 18" to 56" Track Gauge
GREENSBURG MACHINE CO.
Greensburg, Penna.

USED SHOVEL ATTACHMENTS

For Sale

1—Northwest Model 6
3—Northwest Model 25

HODGE & HAMMOND, INC.
720 Garrison Ave. New York, 59, N. Y.
Phone: Kilpatrick 2-2400

DEPENDABLE USED MACHINES

Special,—Hanson truck crane, new in 1944, used in war plant about one year

P&H ½ yd. crane
Browning 25 ton crane
Universal ½ yd. hoe
Badger 203 ditcher
Gallion Jr. grader
Gravel washing plant, 100 t.p.h.
Lorain 40 shovel and dragline
Int. I-4 with front end loader
Meill-Blumberg street marker
Morris 10" manganese gravel pump
Diamond 24x36 crusher
Welch 20x18 roll crusher
Day No. 5 hammermill
Eagle coal crusher
Pioneer 4x8 screen

TRACTOR & EQUIPMENT CO. 10002 Southwest Highway Oak Lawn, Ill.

PAVING EQUIPMENT

1—Rex 34E Double Drum Paver #GD229 with Hydrocycle Control, standard water storage tank, 35' Distributing Boom, controlled door bucket with 10' clearance at end of boom, powered by Waukesha Model 145 GK 6 cylinder, 116 H.P. gasoline engine #720945, complete with auxiliary water pump.
8000 ft. Heltzel steel road forms (800 @ 10' long) with 3 wedged stake pockets and 1 V-type slide lock per 10' section.
1—Plant XR66 Butler 66 cu. yd. 3 compartment aggregate batching bin #6587, with type "M" weighing batcher #83326.
1—Plant CB37 Butler 37 cu. yd. cement batching bin 250 lbs. #6589, Cement weighing batcher #34E1 #83327, Vibrator No. 7 cement elevator #E1101, undertrack screw conveyor gas engine drive LeRoi engine #53X4718—Model D-91-P187.
1—Cleveland form grader, #141X45, powered by Hercules gasoline engine #JXC1318706.
1—Koehring longitudinal finishing machine #LF-799, powered by Hercules gasoline engine.
1—Blaw Knox spreading machine #SA3225, powered by Continental gasoline engine #F2263035.
1—Buckeye fine grader powered by 1 XB-5 Hercules engine—Serial #338, Engine #1XB-5-692706.
1—Jaeger type "X" diagonal screed finisher #50X617 for 10'-12' widths, set for 12' width crown, equipped with quick crown change front and rear screeds, two #32109-2 double flanged traction wheels, two #32127-1 flat rubber tired traction wheels, two extra #32110-1 cone tread traction wheels, and powered with Continental F-140 engine #19669. Now set for 15' width crown, with necessary attachments.
1—Jaeger type "H" diagonal screed finisher #40X245.
40—Tournamatic cement boxes.
1—Adams motor grader #3051.
1—Gallon 3-5 ton roller #TGG16540 (tandem) Engine #VP4-1459166.
1948 Ford dump truck (F7) #88EQ2011.
5—1949 Ford dump trucks (F8) #98EQ25501, #98EQ24979, #98EQ27155, #98EQ27196, 98EQ26185.
2—1951 Ford dump trucks (F6) #R1NR13984, #R1RF13958.
44—Batch boards for trucks.
1944 Chevrolet flat bottom truck #BVH429517.
1944 Chevrolet passenger bus #MR12-6410.

Payne-Oliver Concrete Co., Inc.
901 Leesburg Pike
Falls Church, Virginia

FOR SALE
H BEAMS

8" H	31#	40'
10" H	49#	40'
12" H	65#	40'

BEARING PILES

8" x 36#	to	48#	30'/40'
10" x 42#	to	72#	30'/40'
12" x 53#	to	106#	30'/40'

ALBRO STEEL COMPANY
47-29 Van Dam Street
Long Island City, N. Y.
Stillwell 4-2720—6-5448

NEW and USED
Construction Equipment

1. New 20-25 ton Low Bed Trailer Tandem (air brakes, spring mounted, Bud wheels). $5200.00
2. Used 20-25 ton Low Bed Trailer (same as above). $3750.00
3. Used KB 10-11 1949 International Tandem Tractor (fully equipped for above trailers). Excellent condition. $5000.00
4. TD-24 Tractor Serial No. 900 and 1000 Nos. — Caterpillar No. 25 P.C.U. — push plate, new roller, sprockets, motors, etc. 100-300 hours since rebuilt. Like new. $13,500.00
5. 170 Bucyrus-Erie scrapers — 1800 x 25 — 20 ply tires 6 months used. Serial No. 69819. Near new. $10,000
6. 204 Koehring dragline Serial No. 7781 — UD-16 Engine, long and wide pads — 50' boom 3½-1 yd. Hendrix L. S. bucket (9 months old). Perfect condition. $17,000.00
7. Hyster Heavy duty towing winch Model D8N. Serial No. 12268, used very little. $2700.00

J. D. Armstrong Co., Inc.
Box 307, Ames, Iowa
Phone 2406 Night phone 2319

FOR SALE
CONCRETE BATCH and MIXING PLANT

Plant includes: One 2 cu. yd. Smith tilting mixer, together with concentric aggregate and cement batcher and bins arranged for four aggregates and cement. Has scale equipment and air-entraining admixture batcher; also, steel cement silo with bucket elevator and undertrack screw conveyor.

Located in Northern Michigan. Available about July 1, 1951. Purchased new and has been used to mix only about 40,000 cu. yds. of concrete.

THE TULLER CONSTRUCTION CO.
RED BANK, NEW JERSEY

FOR SALE
45 TON GANTRY CRANE
Model 200 Colby, 110 ft. boom, 24' track gauge, 25 ft. gantry
30 TON GANTRY CRANE
Model 685 American, 90 ft. boom, 14' track gauge, 12 ft. gantry

INDUSTRIAL EQUIPMENT COMPANY
4441 Santa Fe Ave., Los Angeles 58, Calif.
Kimball 7141
1022 77th Ave., Oakland 21, Calif.
Sweetwood 8-6300

SAVE OVER $10.00
NEW "AMES" #2 HEAT TREATED
CONTRACTOR'S SHOVELS

Has armored "D" white ash handle, 9½" x 12" square point, turned step, high bend and perfect balance. NEW —Slight rust from storage.

$17.75 A DOZEN F.O.B. PHILA.

BRAND NEW—U. S. NAVY
PORTABLE SPOTLIGHT

COMP. WITH CASE & 4 COLOR FILTERS YOUR CHOICE OF 6—12 & 24 V. BULB

Regular $35.00 Val **$7.50** P. POST PAID

A powerful light for contractors' equipment. Has toggle switch and trigger switch for signaling, filters are red, green, yellow and violet. Also has detachable swivel mounting bracket. Bulb is sealed beam type.

Rated Firms Open Account—Other Send Check

J. JACOB SHANNON & CO.
214 N. 22nd St. Phila. 3, Pa.
The Oldest Equip. House in Phila.

REX DUAL DRUM PAVER

Model 34E. Model duomatic, powered with 6-cylinder gasoline engine. Rex mechanical man, batchmeter, 35' distributing boom. Serial #GG-126. Completely reconditioned, ready for paving. Price on application, subject to prior sale. Can be seen at our Philadelphia warehouse. Write, wire, visit.

FURNIVAL MACHINERY CO.
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FOR RENT

For Rent
SPEEDCRANES
LATE MODELS

Manitowoc Diesel Powered Speedcranes for rent. 25, 40 and 60 ton capacities with booms 100' or more, 20' and 30' jibs. Special price on long rentals.

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Tel. STillwell 4-1030

SURPLUS EQUIPMENT FOR SALE

Bay City, 1¼ yd., Model 65, equipped with shovel and crane boom.
Northwest, ¾ yd., Model 25, equipped with crane boom.
Link-Belt, ½ yd. Model LS-60, equipped with crane and backhoe.
Parsons Trencher, Model 25.
Caterpillar D8 Tractor with bulldozer.
Allis-Chalmers HD-14 Tractor with bulldozer.
Allis-Chalmers HD-19 Tractor with bulldozer.
Caterpillar No. 12 Auto Patrol.
Adnun Black Top Spreader.
All of this equipment is now operating and will be available in about two weeks, and can be inspected in the vicinity of Dover, Delaware.

GEORGE & LYNCH, INC.
M-209 Delaware Trust Bldg., Wilmington, Delaware

FOR RENT
Truck Cranes
P & H
Link Belt
Lorain
Bay City

Booms 30' to 140'
Special Terms for Long Term Rentals
Derricks, Hoists, Compressors & Welding Machines
also
Safeway Steel Scaffolding for Rental or Sale

MARR EQUIPMENT CORP
26 D Street South Boston, Mass.
South Boston 8-0784

250 H. P. V type LeRoi Engine run by natural gas—New 1945
Vee Belted to Chandyson Generator 230V., 610 Amps., D. C.

DAVEWOOD SUPPLY CO.
Alpine & Guilford Rds. Rockford, Ill.

LIKE NEW
2 SEAMAN PULVI-MIXERS
MODEL MHD-84. 7' wide.
Powered by Waukesha gas engine.
New in 1949.

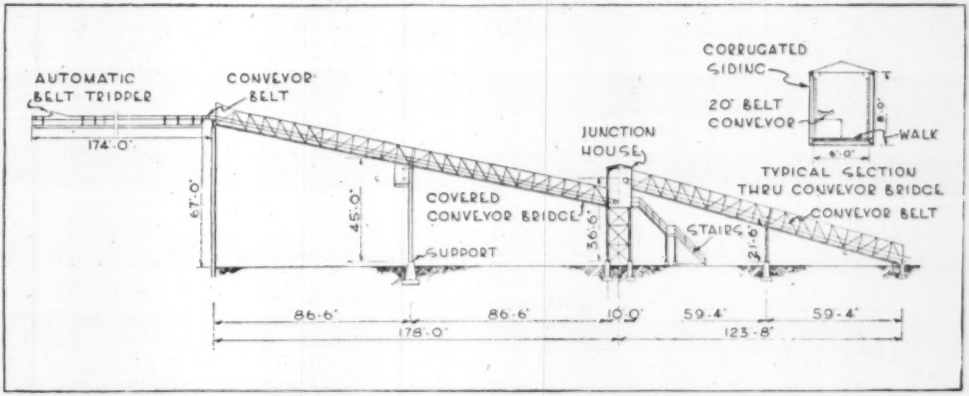
EDWARD EHRBAR, INC.
29 Meserole Ave., Brooklyn 22, N. Y.

FOR SALE

LINK-BELT 20" BELT CONVEYOR

Complete with Belts, Drives, Rollers and other equipment

AS ILLUSTRATED



Suitable for handling most any bulky material
COAL - GRAVEL - ORES - COKE
SAND - DIRT - GRAIN

Supported by truss work and completely enclosed
A Walkway is provided in the enclosure alongside the conveyor

Excellent condition. Rated capacity over 4000 cu. ft. per hour. ***PHONE—WIRE—WRITE***

GLAZER STEEL CORPORATION

KNOXVILLE, TENN.
Phone 4-8601

P & H 255 A Truck Crane #11609 80' boom 15' Jib Power Boom Hoist
MC 414 Lorain Truck Crane #14800
NW 25 Crane & Drag #11760 Cat D-318
NW 6 Shovel & Back Hoe 1944 good
New NW 80 D Shovel & 3 Tournarocker
3 Hyster D&N Towing Winches with controls
Cat D 4 with Hyd. Angle Dozer very good
Garwood 525 Scraper 25 yd capacity
2 #49 FD Euclid Rear Dumps $7600
3—38 FDT Euclid Bottom Dumps $8700
6—9 FDT Euclid Bottom Dumps Bargain
Bucyrus Erie 38 B Shovel & Drag $6700

CHAS. M. INGERSOLL

19930 Detroit Rd. Rocky River, Ohio
Edison 1-1010

BULLDOZERS TD-18 & TD-14, fully rebuilt
LORAIN 820 Diesel 2 cy Shovel, 1948
LORAIN 80 Diesel 1-3/4 cy Shovel & Dragline
P.&H. 150 Truck Crane on ten-wheel Fed'l truck
Critical Parts for Cat & Int'l Tractors
New Amsco Dipper 1¾ yard for Lorain 80

BENDIX MACHINERY CO., INC.
401 Broadway, N. Y. 13, Tel: Canal 6-5693

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3 C-11 Tournapulls

with

E-16 Scrapers

Machines and Tires in good condition • Tires 75% new

$12,000 each

F.O.B. Swedesboro, N. J.

S.J.GROVES AND SONS COMPANY

19 Rector St., New York, N. Y.
WHitehall 3-1055

A-1 USED EQUIPMENT

* **SHOVEL**—Northwest Model 25, ⅝ Yd, 2 years old, operated 2900 hours, Caterpillar Diesel engine, looks like new machine.

SHOVEL—P & H Model 255A—⅝ Yd., 4 years old, powered by Buda Diesel engine, new tracks. Machine in very good condition. A bargain at $8500.00

SHOVEL—Northwest Model 70, 2 Yd. Dipper—powered by Murphy Diesel engine. Engine has been completely rebuilt. Machine in very good condition.

SHOVEL & DRAGLINE—Link Belt Speeder K-360, 1⅛ Yd. Combination Shovel, crane, dragline, on 24" treads, Caterpillar D 13000 Engine, 50-Ft. Boom 1½ Yd. Amsco Dipper. Machine new in February, 46, very good condition.

SHOVEL & DRAGLINE—Koehring Model 605—Combination Shovel & Dragline, machine new in January, 1947, 50 Ft Boom, 2 Yd Rock Dipper, also 3⅝ Yd Coal Loading Bucket. Machine in very good condition, has been thoroughly cleaned and painted. No dents in cab.

SHOVEL & DRAGLINE—Bay City Model 20—⅝ Yd Standard Shovel Front, 50-Ft Dragline Boom, machine has been reconditioned and is in good operating condition. Price..... $5000.00

* **DRAGLINE**—Northwest Model 25, ¾ Yd, 4 years old,-Caterpillar Diesel engine, wide cats, 40-Ft Boom, looks like new machine. Excellent condition.

* **DRAGLINE**—Northwest Model 95—2½ Yd Dragline, 80-Ft Boom, 3 Yd Hendrix Dragline Bucket, powered by Murphy Diesel engine, machine new in December, 1949—has not been used continuously. This machine is in excellent condition, very good appearance.

BUCKET LOADER—Barber-Greene, Model 82-A, 3 years old, in very good operating condition and looks good. A bargain—Price..... $4000.00

CONVEYOR—Portable Barber-Greene — 30 Ft Length, 24" Belt, mounted on Pneumatic tired wheels, same as new, used to unload 15 carloads of material. Price..... $2000.00

POWER UNIT—2 Caterpillar D-13000 Power Units, in very good operating condition.

** Asterisk Items available for Sale or Rent*

PERSHING EQUIPMENT COMPANY, INC.

1710 North Fares Ave.
(Highway 41-North) Evansville, Ind.
Phone 2-41595

FOR SALE

5—Model TCY Terra Cobra Scrapers—14 yard struck, 21:00x24 tires—24 ply.

Good mechanical condition, tires 75%. Priced to move.

EUCLID MEMPHIS SALES, INC.
185 E. Butler Ave.
Memphis, Tennessee
Phone: 8-0491 P. O. Box 2493

FOR SALE

P. & H. Model 255, dragline
Lorain, model 50, backhoe
Northwest, model 25, Backhoe
Bay City, model 65, backhoe & Dragline
Bay City, model 52, dragline
Backhoe attachment for Marion model 352
Shovel Front attach. for Buckeye model 70
Shovel Front attach. for Northwest model 25
Shovel Front attach. for P. & H., model 255
8-½ ton grab type, clamshell bucket
1-¾ yard Pull Shovel bucket for Northwest
3 yard dipper bucket
30 ton Orton Locomotive Crane, gas powered

The STONE EQUIPMENT Co.
10038 W. Jefferson Ave., River Rouge 18, Mich.

FOR SALE

Lorain model MC 414 Truck Crane.
Lorain model TL 20 Truck Crane.
Bay City model 180 Truck Crane 20 Ton.
Lorain model 820 Crane.
Lorain model 81 Crane.
Pile Driving outfit—complete.
Blaw Knox 500 BBL Cement bin—complete.
Tunnel Equipment Cars, Locomotive, Air Locks.
Saw Mill—Fay Egan. Complete w/planer, Matcher & Edger.
Northwest 95 Dragline 1950.
Bucyrus Erie 38 B Comb. Shovel & Drag.
Koehring model 501 Crane.
Parsons M 31 Trencher.
Cleveland 110 wheel Type Trencher.
Pioneer Jaw Crusher, 30 x 42.

L. M. KELLER & SON
133 N. Ridgeland Ave. Oak Park, Ill.
Telephone Euclid 6-8691

FOR SALE
CONTRACTORS EQUIPMENT

1—9W Monighan Dragline
3—120 Lima Draglines & Shovels
1—79 Lorain Shovel
1—455 P&H Shovel
2—D8 Caterpillar Tractors
2—D6 Caterpillar Tractors
2—Hardsocg Horizontial Drills
1—Buda Vertical Drill
13—27 FDT Euclid Haulers
4—Half Track Trucks
9—Service Trucks & Pickups
1—10 Ton, 3 Wheel Roller
1—160 ft. Air Compressor
Your Inquiries Solicited

TERTELING BROS., INC.
Box 631 Zanesville, Ohio

FOR SALE
AUSTIN-WESTERN "99" M GRADER

Serial M-7362. With bulldozer and sloping blade. Excellent condition. Good rubber.

MACLEAN CONSTRUCTION CO.
706 E. Sheridan St. Lansing, Mich.

FOR SALE
One 50' Lattice Type Boom

For 40 Ton Orton Crane now located in N. Carolina. No reasonable offer refused. Address inquiries to our Purchasing Office.

WILLAMETTE VALLEY LUMBER CO.
Dallas, Oregon

FOR SALE OR RENT

2 SUPER C TOURNAPULLS
12-15 YD. CAP.
MODEL M LE TOURNEAU SCRAPER
6-8 YD. CAP.
CONSTRUCTION EQUIPMENT & SUPPLY CO., INC.
39 Lackawanna Plaza Bloomfield, N. J.
Bloomfield 2-7443

Notice to Advertisers

Because of the Labor Day Holiday, September 3rd, the "Searchlight" pages of the

September 6th Issue of

ENGINEERING NEWS-RECORD

Close for press earlier than the usual weekly closing time.

The cooperation of advertisers is solicited in forwarding new copy, or changes of copy, to reach us accordingly.

FINAL CLOSING TIME
Display and Undisplayed Ads
Friday, August 24th
PROPOSALS
Thursday, August 30th

HAULING EQUIPMENT

2 C-11 Tournapulls #B6T2406-C11-C, #B6T2407-C11-C
4 Super C Tournapulls #C3T5682C1H, #C3T5516 C1H, #C3T5550C1H, #C3T5667C1H

OTHER EXCAVATING EQUIPMENT

TD-9 International tractor with angle dozer #TDCB26136T7CE
TD-18 International tractor with hydraulic blade #TDR14378T7CC
Caterpillar grader Model No. 11, #6K823
¾-yard Lorain truck crane on 10-wheel Mack #468045-10072
D-6 Caterpillar tractor with hydraulic angle blade, #9U1181
Galion 10-ton roller #R11513
LaPlant-Choate road roller, Model 224
¾-yard Link-Belt shovel #2B-104, Model LS-70, Caterpillar motor
ID-9 International rubber tired tractor #1DCB 7990

W. W. OLIVER, *Agent*
901 Leesburg Pike. Falls Church, Virginia

SURVEYING INSTRUMENTS
USED • REBUILT • SALE
RENT • REPAIRING

FROM STOCK
Brand New & Rebuilt
TRANSITS & LEVELS
Fully equipped modern shop—all makes and models repaired — all work guaranteed — instruments rented
Midwest Representative: W. & L. E. Gurley
NATIONAL BLUE PRINT CO.
Established 1914.
210 S. Canal St. Chicago (6), Ill.

TRANSITS AND LEVELS

New or Rebuilt Sale or Rent
Headquarters for REPAIRS — any make — Factory Service. We will also buy your old instruments or take them in trade. A complete line of Engineering Instruments and Equipment for field or office. Write for catalog N.R. 1-8.
WARREN-KNIGHT CO.
Manufacturers of Sterling Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

SPECIALIZED REBUILDING
of surveying and engineering instruments
All makes and models expertly repaired in modern shop. All work guaranteed
USED REBUILT INSTRUMENTS
for sale or rent
ROY D. HICKERSON
8 N EDMONDSON AVE INDIANAPOLIS 19, IND

RE-BUILT REPAIR RENT REAL EXPERTS — BUFF — ALL MAKES
69 Day St., New York

QUALITY REPAIRS
by the makers of the
WORLD'S QUALITY SURVEYING INSTRUMENTS
Since 1871
C. L. BERGER & SONS, INC.
37 Williams Street, Boston 19, Mass.

OFFICIAL PROPOSALS

(Continued from page 121)

Bids: August 20, 1951

Approach & Exit Lanes for Service Station

Sealed proposals will be received by the Pennsylvania Turnpike Commission through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania until 11:00 A.M. (Eastern Daylight Saving Time), the 20th day of August 1951, and at that time and place will be publicly opened and read aloud for the following contract and/or contracts:

For construction of Approach and Exit Lanes at the Cove Valley Service Station on the Pennsylvania Turnpike. This work is situated as follows:

Cove Valley Service Station is located in Taylor Township, Fulton County, and adjacent to the Pennsylvania Turnpike.

The approximate quantities of the principal items are as follows:

Class 1 Excavation	9,500 cu. yds.
Subgrade	5,000 sq. yds.
6" Special Subgrade	5,000 sq. yds.
Reinforced Concrete Pavement	3,000 sq. yds.
Bituminous Surface Course, ID-2	70 tons
Stabilized Shoulders	900 lin. ft.

For construction of Approach and Exit lanes at the New Stanton Service Station on the Pennsylvania Turnpike. This work is situated as follows:

New Stanton Service Station is located in Hempfield Township, Westmoreland County, and adjacent to the Pennsylvania Turnpike.

The approximate quantities of the principal items are as follows:

Class 1 Excavation	1,510 cu. yds.
Class 2 Excavation	200 cu. yds.
Subgrade	4,950 sq. yds.
6" Special Subgrade	4,950 sq. yds.
Reinforced Concrete Pavement	2,818 sq. yds.
Bituminous Surface Course, ID-2	146 tons
Stabilized Shoulders	850 lin. ft.

Copies of plans, specifications and other contract documents are on file and open to public inspection at the offices of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania, on August 8, 1951. Copies of specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five ($5.00) dollars per copy.

Plans and contract documents, exclusive of specifications, may be obtained from the Commission upon deposit of ten (10.00) dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans and contract documents returned, if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications and contract documents.

The Pennsylvania Turnpike Commission reserves the right to award each site as a separate contract or in a combined contract.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

The Commission reserves the right to waive any informalities in and to reject any or all bids.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

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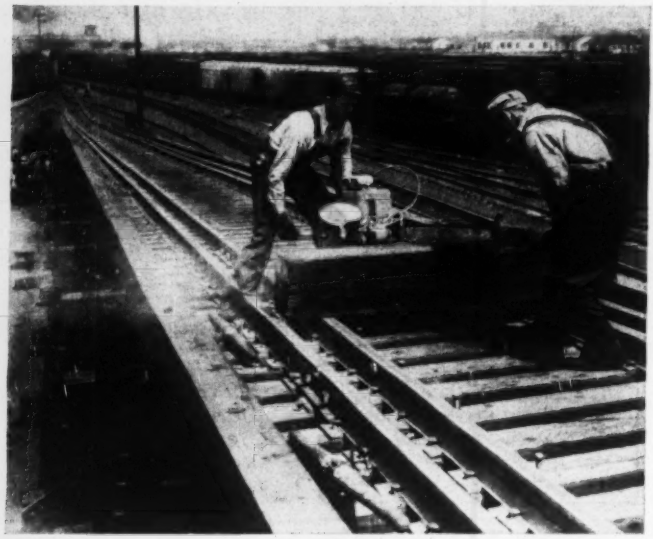

Heavy-duty chain saws available once more

Unavailable to civilian consumers since the Army contracted for total output during the present emergency, Disston's extra-duty chain saw, the DH-120, is again available in quantity through their chain of national dealers. Shown here on a tough trestle job, the 12 horsepower unit literally chews through timbers up to 12 x 12-in. in size. Contact any local dealer or HENRY DISSTON & SONS INC., UNRUH AND MILNOR STREETS, PHILADELPHIA 35, PENNSYLVANIA.

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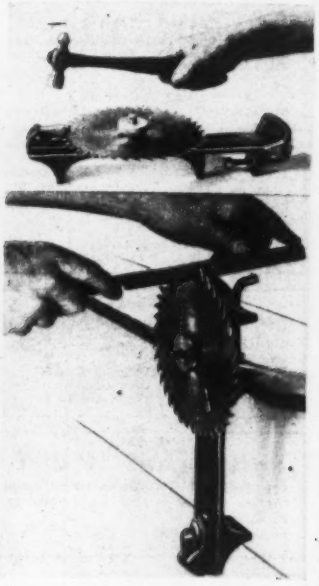

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Use the clamping device on this tool to fasten it into a vertical position; then clamp in your circular saw blade with diameter anywhere between 6 and 18 inches. There's a special tension bar which assures proper tension while you're filing. When it's sharp enough to suit you, don't remove the blade—instead unclamp the tool from the bench and lay it down. Push the blade to the other end where a tooth will slide in between a hammer and anvil pre-set to an angle of 15 degrees for setting the sharpened teeth. When that's done put the tool away in any standard size tool box. That's all there is to it. The two-in-one tool known as SHARP-SET accommodates all standard size and shape arbors and, because of its compactness and portability, invites frequent sharpenings and settings. CLARK & SAWYER INC. 600 MATEO STREET, LOS ANGELES 21, CALIFORNIA.

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(*Continued on page 136*)

Service records like this

Why Genuine Wrought Iron Lasts

This notch-fracture test specimen illustrates the unique fibrous structure of genuine wrought iron—which is responsible for the high corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

In the pipe lines serving the Department of Agriculture's new National Arboretum, Washington, D.C., durability was safeguarded in a *time-proven* way, by installing genuine wrought iron pipe. The main illustration above shows a section of 4" Galvanized Byers Wrought Iron pipe being placed in the outer garden plots which surround the new research center. This material, in 1½" and 2" sizes, was also used for underground utilities covering the laboratories and greenhouse group.

The soundness of this selection is supported by many unusual service records established by genuine wrought iron pipe. For instance—the insert photograph shows a section of 44" O.D. genuine wrought iron pipe, installed by the San Francisco Water Department in 1885, being removed for cleaning. Close examination revealed that the pipe was in first-class condition with not a single hole or thin place after its many years of service.

If you are planning a new or replacement underground pipe installation, keep in mind that this service presents a double corrosive threat—inside attack from the water; outside attack from the soil. The only practical solution is in the use of a corrosion-resistant material. And keep in mind too, that Byers Wrought Iron pipe has rolled up some of its most impressive records in this service . . . which we will be happy to show you.

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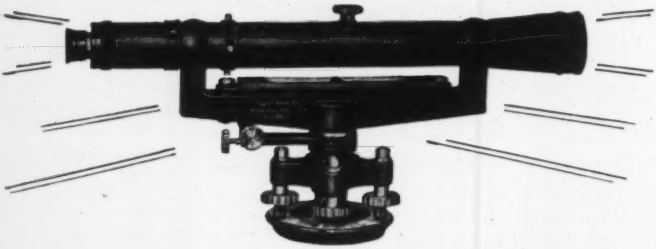

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Features	D. White No. 7080	Instrument A	Instrument B
Magnifying Power of Telescope	35X	30X	27X
Distance away you can read 1/100 ft. graduation	1200 ft.	1050 ft.	900 ft.
Diameter of objective lens	1.81 in.	1.485 in.	1.69 in.
Field of view (In minutes of arc)	64'	52'	60'
Coated optics	YES	YES	YES
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crete." This two-coat method entails applying clear "Oncrete" as a first coat and colored "Oncrete" for the second. The first is said to provide an adhesive and moisture barrier for the latter, giving high adhesion performance on concrete, brick and other porous masonry materials. LOWEBCO, INC., 1525 EAST 53RD STREET, CHICAGO 15, ILLINOIS.

Adhesive-backed tape

Known as KLING FELT, its pressure-sensitive adhesive back does not require a paper separation strip between layers when rolled for shipment. Available in rolls from ¼ in to 66 in in width and in the following thicknesses: 1/64, 1/32, 1/16, ⅛, and ¼ in. Also die cut to specification for gasket replacement. Manufacturer claims it is usable for squeak deadening; sealing against dust, fumes, foreign materials etc; as a thermal insulator; shock cushioning in crates and scratch protection. Finger pressure makes it adhere—even overhead—without extra adhesives. PRODUCTS RESEARCH COMPANY, 5426 SAN FERNANDO ROAD, GLENDALE 3, CALIFORNIA.

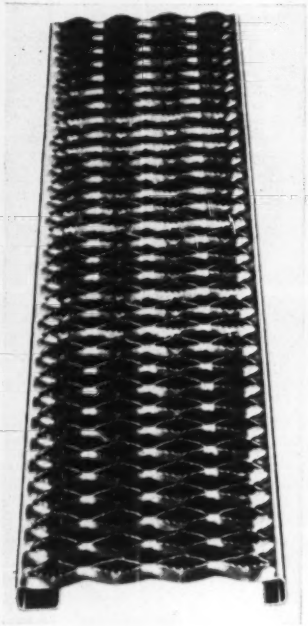
Inflow, not pressure, controls well pumpage

Provincetown (Cape Cod) pumping station avoids sea water contamination of its wells through pump flow control based on inflow to wells rather than pressure in distribution mains.

Excessive pumping during periods of great demand easily could draw salt water into the wells located in North Truro, Mass., near the tip of the Cape. A special control device limits pumpage, assuring a withdrawal rate that never exceeds inflow to the

wells. Flow is adjustable up to the established limit.

The flow controller electrically positions the throttle of a diesel engine that drives the pump. Further details of the installation are obtainable from manufacturer. THE FOXBORO COMPANY, FOXBORO, MASS.



Skid-proof grating

Non-skid grating is called Grip-Strut Grating, because it presents a skid-proof surface on the edges of a series of formed struts. These are joined in turn by integrated saddles to create strong lateral struts. The grating itself has a diamond-shaped pattern and the open area is 75% of the total reticulated surface. Manufactured from sheet steel or aluminum of gauges 12 to 16, manufacturer's tests revealed that a typical section, 20 in. wide and 48 in. long, withstood over 100,000 one-inch oscillations without any damage, separation of struts or distortion. Suggested uses include catwalks, work platforms, steps etc. THE GLOBE COMPANY, 4000 S. PRINCETON AVENUE, CHICAGO, ILLINOIS.

Air conditioners

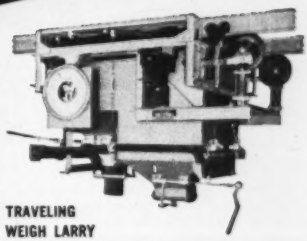
Reciprocating-type refrigeration machines are available for use in the 100 and 150-hp range. The 30B's are

(Continued on next page)

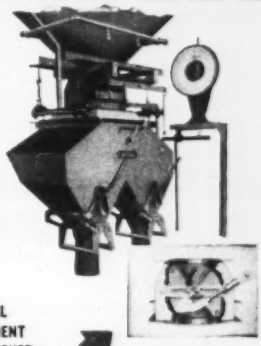
Heltzel BUILDS IT BETTER

BATCHING PLANTS

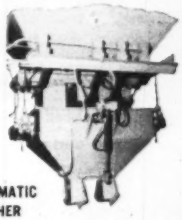
● Heltzel batchers exemplify the advanced engineering that is incorporated in **all the details** of Heltzel batching plants. Heltzel manufactures ten types of batchers specifically designed for faster, more accurate batching. Portable aggregate or cement plants, combination cement-aggregate plants, or circulating bulk cement plants — whichever you require, Heltzel affords you more value for each operating dollar.



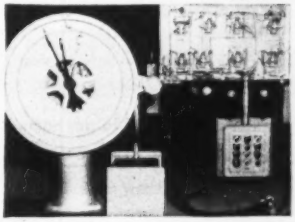
TRAVELING WEIGH LARRY

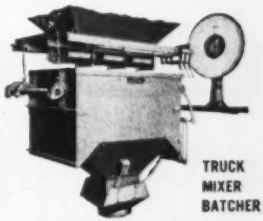


DUAL CEMENT BATCHER WITH TUBULAR CEMENT VALVE



AUTOMATIC BATCHER WITH CONTROLS





TRUCK MIXER BATCHER

HELTZEL

STEEL FORM & IRON CO.

WARREN, OHIO

flexibility

FOR THE CHANGING PICTURE IN STEEL

From concentration on the fabrication of structural steel for such peacetime purposes as business structures to the fabrication of Bailey Bridges . . . from products like revolving doors to giant, mechanized hangar doors — these typify the many changes International Steel has made in adjusting its production to the nation's shifting needs. These change-overs were made with great speed and efficiency. They are a demonstration of the kind of flexibility and resourcefulness that is so important in a steel fabricator today. As the changing picture in steel makes it possible to meet more civilian steel requirements, you can count on International to show the same kind of flexibility and resourcefulness in serving you . . . to continue standards of service that have kept contractors, architects and engineers looking to this company for the most skilled and interested cooperation in meeting their needs and solving their problems.

INTERNATIONAL Steel Co.

STRUCTURAL STEEL
STEEL BUILDINGS
STEEL TRUSSES
BUILDING PRODUCTS

1859 Edgar Street
Evansville 7, Indiana

New Products . . .

furnished as complete units with compressor, cooler, condenser, and all attachments, gages, and controls included. Compact assembly reduces pressure loss to a minimum, assures better over-all performance, and permits a wide range of applications where space is critical.—CARRIER CORP., SYRACUSE, N. Y.

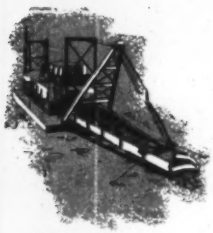
Remote foot control for voltage on arc welders

Many standard DC welding units have a socket which will take the plug on this foot-operated variable resistor. Most others, including AC's, can be quickly adapted for it. It gives instant selection or variation of any welding heat within the capacity a machine, says the manufacturer. It also improves the soundness of welds by providing a hot start which helps to overcome porosity and cracks on cold work. After two or three inches have been welded voltage can be stepped down easily, balancing heat input with dissipation. Voltage on the ARCTROL can be varied to the extreme of actually extinguishing the arc at completion of a weld, thus avoiding any cratering. Information on application of this control to specific welding machines is available from MULLENBACH ELECTRICAL MANUFACTURING COMPANY, 2300 E. 27TH STREET, LOS ANGELES 58, CALIFORNIA.

Hydraulic jack

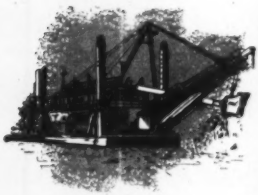
Here's a jack with a lifting capacity of 25 tons on both its toe and cap—because a bearing roller in the toe carries radial loads against the flat milled surface of the stationary ram (see dotted lines in photo). This ram doesn't travel—the heavy body lifts the load instead. Its oil reservoir is independent of this load-lifting housing, and the manufacturer says this eliminates pressure stress, as well as

(Continued on page 141)



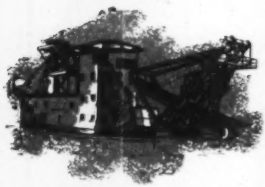
DESIGN

As builder of all types of dredges — dipper, placer, clamshell and hydraulic — Bucyrus-Erie is qualified to recommend without prejudice the type that best suits your needs. And to assure a design that *exactly* fits requirements of the job, experienced engineers make a careful on-the-spot study of all factors involved.



MATERIALS AND WORKMANSHIP

Bucyrus-Erie not only specifies the best materials for the job, but carefully tests them in a modern, completely equipped laboratory. The company also operates its own machine, foundry, forge and erecting shops . . . entrusts manufacturing to craftsmen with years of skill in dredge building.



EXPERIENCE AND REPUTATION OF BUILDER

Make certain that your dredge is built by a company that knows it business. During 66 years of dredge-building, Bucyrus-Erie has manufactured more than three hundred units for users all over the world — most of which are still in operation. This is a record of experience unparalleled by any other dredge manufacturer—your assurance that Bucyrus-Erie is a real dredge buy.

30051

BUCYRUS ERIE SOUTH MILWAUKEE, WISCONSIN

Iron ore from Bethlehem Steel's Venezuelan mines is handled by these unloaders at the tidewater terminal of Puerto de Hierro. Operating on a 660-ft pier each of these unloaders can handle an average of 450 tons of ore per hour. All of the structures were built of Mayari R.

Ore Unloaders in Venezuela Constructed of Mayari R

less deadweight...higher corrosion-resistance

These ore unloading towers at the tidewater terminal of Puerto de Hierro, Venezuela, were built entirely from Mayari R, Bethlehem's corrosion-resisting, low-alloy, high-strength steel. Designed to unload river barges, each tower is a huge traveling crane with a clamshell bucket that operates from a hinged horizontal boom. The bucket lifts the ore from the barges and drops it onto a conveyor belt that deposits it on shore where it is stock-piled to provide a backlog for uninterrupted shipments. For the loading operation another system of conveyor belts carries the ore from the stock pile directly to the holds of large ocean-going carriers.

There are two reasons why Mayari R was specified instead of plain structural grade carbon steel. Because of its higher yield point Mayari R could be used in lighter sections to reduce deadweight. Also, because of its superior resistance to corrosion, Mayari R could be expected to last considerably longer than carbon steel in the tropical, seacoast atmosphere.

Mayari R has been used to advantage in hundreds of industrial structures located in many parts of the world. Information on these applications is readily available. Write or phone our nearest sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

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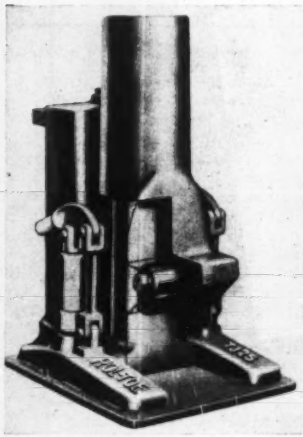
Mayari R *makes it lighter...stronger...longer lasting*

New products . . .



preventing oil leakage caused by the reservoir's breaking away from the base. The Simplex Rol-Toe Jack has two pumps—one is high-speed for positioning and lifting light loads, and the other is a high-pressure pump for heavy lifts. A built-in safety bypass valve prevents overloading. Jack is usable vertically or horizontally and is made by Templeton, Kenly & Company, 1020 South Central Avenue, Chicago 44, Illinois.

Roller type conveyor

Using steel rollers to replace skate wheels, this conveyor is especially recommended for objects and bundles not having a rigid, flat bottom. Mounted on heavy casters, it is readily telescoped in or out to a maximum of 30 ft. Supplied in 12- or 18-in widths, the rugged, all-steel rig can be quickly rolled from one job to another, or stored easily in a truck. The Wilkie Co., 5520 Arch Street, Philadelphia 39, Penna.

(Continued on next page)

SISALKRAFT
WATERPROOF SISAL-REINFORCED PROTECTIVE PAPERS

PROVIDE All-Weather PROTECTION for MEN, MATERIALS and EQUIPMENT

Rugged SISALKRAFT, easy to handle, is the most economical protective cover you can use for closing-in open structures and for covering materials and equipment. Also for curing concrete.

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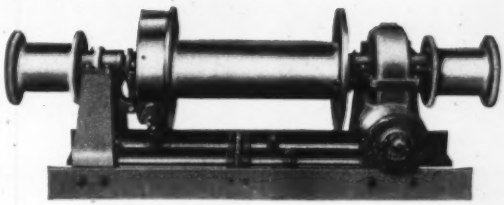
PULL and POWER

Tulsa Winch models for all trucks from ½-ton up.

Tulsa Winches for all crawler tractors complete with transmission, line roller assembly and mounting brackets ready for installation.



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*Reg. U. S. Pat. Off.

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Stang WELLPOINT SYSTEM

For KNOW HOW • ENGINEERING • SUPERVISION • EQUIPMENT • to keep jobs DRY

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

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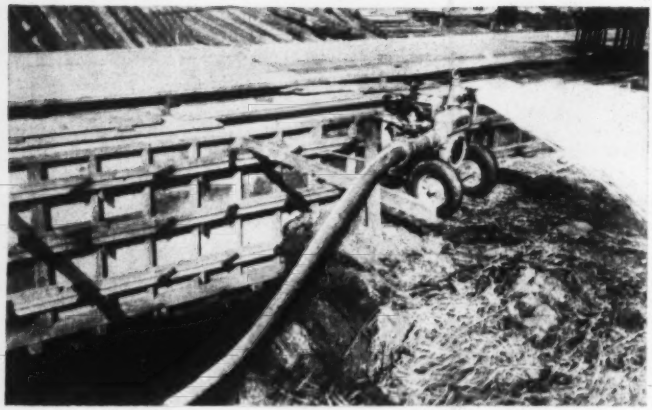
2 Broadway, New York 4, N. Y. — 2123 S. 56th St., Omaha, Nebr. — 8221 Atlantic Ave., P.O. Box 631, Bell, Cal.



New pumps feature adjustable air peeler

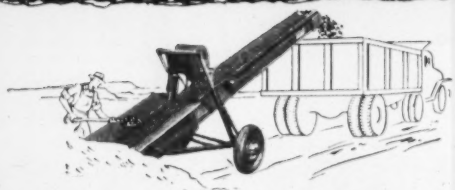
Guaranteed to meet the capacity standards adopted by the Contractors' Pump Bureau of the Associated General Contractors of America, a new line of self-priming centrifugal pumps has been put on the market with capacities from 4,000 to 90,000 gph. These new Rex pumps, according to the manufacturer, assure maximum water handling with their adjustable air peelers and open type impellers. When abrasive wear on either or both of these parts destroys original clearances and pump priming, the rig can be quickly restored to its original efficiency by adjusting the peeler to its former tolerance. The impeller shaft seal is located on the suction side of the pumps and therefore never subjected to varying pumping pressures, resulting in longer, trouble-free operation. CHAIN BELT COMPANY, 1600 W. BRUCE STREET, MILWAUKEE 4, WISCONSIN.

MANUFACTURERS' PUBLICATIONS

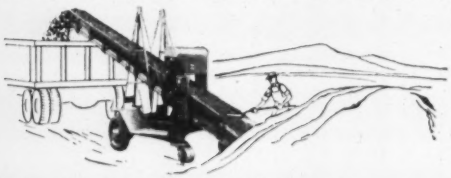
Standards for multiple V-belt drives—Issued jointly by the two organizations listed below, as developed and approved by their technical committees. The data is based on latest engineering and research, and indicates proper sheaves, and belts to be used for optimum efficiency and economy of the complete drive in relation to the particular duty required. Standards may be obtained at a cost of one dollar ($1.00) for two (2) copies. Write either the MULTIPLE V-BELT DRIVE ASSOCIATION, 7 WEST MADISON STREET, CHICAGO 2, ILLINOIS or the RUBBER MANUFACTURERS' ASSOCIATION INC., 444 MADISON AVENUE, NEW YORK 22, N. Y.

Slackline cableway excavator—28 page catalog where to use, when to use and cost of using this machine which the manufacturer claims can dig, convey, elevate and automatically dump materials all in one motion. Over one hundred action photographs are included, showing the rig at work in gravel and clay pits, reservoirs, earth dams, etc. General Catalog, Section C. SAUERMAN BROS. INC., 532 SOUTH CLINTON STREET, CHICAGO 7, ILL.

Are You Ready For Those Highway Jobs?



When it comes to material handling—sand, gravel, crushed stone and what have you—the Light Weight Troughed Belt Conveyor, Model 666, will show you efficiency in action. It has a capacity of 75 yds. of sand or gravel per hr. Standard equipment: underslung axle, twin hydraulic boom hoist, slide trough and 14"—4 ply belt. You'll find Model 666 is built for a lifetime of rugged service.



For those heavy-duty stock piling and loading jobs, the Power Moved Heavy-Duty Troughed Belt Conveyor will do a real job. This smooth operating conveyor is equipped with even keel balance, hydraulically operated boom hoist, and hydraulic drive. Extra-heavy construction means maintenance economy and years of top performance.

● There's going to be millions spent for repairs on the nation's highways . . . frost damage in 1951 has been the worst in years. There's a lot of work that has to be done in a hurry. You'll need all the speed and ease of operation you can muster for those material handling jobs. If you're shoveling those truck loads, you can put away your shovels and step up efficiency! Fairfield conveyors will do the job—they're fast, work with ease, and are dependable. They'll pay for themselves . . . those extra pay loads will do it. Here is your opportunity to put Fairfield "profit builders" to work in your operation. *

Sand, lime, cinders, etc., are unloaded from railroad cars in a hurry by the Power Moved Belt Car Unloader. Teamed with your Fairfield conveyor, you'll have a highly efficient combination.

There's real versatility in the Heavy-Duty Troughed Belt Conveyor. It handles crushed stone, cinders, even brick, and tile. Model 608 features swivel carriage, self-locking boom hoist, and three-roll type ball-bearing idlers.

* Complete details are available in Bulletin 450. Write for your copy today.

FAIRFIELD

The FAIRFIELD ENGINEERING COMPANY

354 Chicago Avenue — Marion, Ohio

Tractors on pipeline work—Spectacular pictures and information on how problems were solved and delays averted on pipeline jobs fill this 12-page booklet titled "International Power Lowers the Boom on Pipelaying Costs". Every phase is included from the clearing and leveling to lowering in, backfilling and cleanup. The front page has a Selectograph showing full range and lifting capacities of five sizes of superior sidebooms which match the TD series of tractors. INTERNATIONAL HARVESTER COMPANY, 180 NORTH MICHIGAN AVENUE, CHICAGO 1, ILLINOIS.

Filter beds—This new four-pager describes the Layne Multi-Plate Underdrain System. These plates channel the upflow horizontally when backwashing a water purifying plant. Cutaway sections show the stainless steel baffles and a typical installation shows the resultant even water distribution and non-clogging features of the Multi-Plate. GENERAL FILTER COMPANY, AMES, IOWA.

Plant tractor—called Model 3600—has been added to the Kalamazoo line of pulling equipment for use in industrial plants and warehouses. Powered with a 13 HP Wisconsin engine through an automotive type clutch, it has three speed and reverse transmission. It will pull as many as ten loaded trailers. Complete dimension and specification sheet available. Ask for Bulletin T-3600. KALAMAZOO MANUFACTURING COMPANY, KALAMAZOO, 24F, MICHIGAN.

Instrument tubing—This bulleting describes the advantages of a plastic-coated metal tubing where high corrosion resistance is required. Titled "Dekoron Instrument Tubing", the two-page bulletin shows photographs of installations and tubing service data for a number of severe applications. Available on request from SAMUEL MOORE & CO., DEKORON TUBING DIVISION, MANTUA, OHIO.

Wall forming systems—Incorporated in this new 34-page catalog is all of the latest information and improvements in the Symons forming system. Illustrations show in detail how simply the units can be installed. Actual jobs are well illustrated. Also included are typical blueprints, complete specs, material and equipment needs, cost and time figures on actual jobs. Manufacturer offers a free form layout of your job without charge or obligation if you'll just send him the plans and specs. SYMONS CLAMP & MANUFACTURING COMPANY, 4249 DIVERSEY AVENUE, CHICAGO 39, ILLINOIS.

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FIRE ON WATER became an added hazard when oil tanks broke into flame during the recent flooding of the Kaw River. Here flame and water lick through the industrial section of Kansas City, Mo.

Teamwork at Kansas City

How Army Engineers, contractors and labor unions joined hands to fight disaster in the stricken valley of the Kansas River

Floodwaters at Kansas City had barely begun to recede from their all-time record before state, city, federal and private interests began one of the biggest rehabilitation jobs on record in that area.

Teamwork was the keynote of the operations. Contractors and labor unions threw equipment and men into a fast clean up job on a non-profit basis. A nine-man standing committee of public works, public health and consulting engineers was organized on the spot to supply much-needed technical advice and engineering services in the interest of public health and safety. The RFC quickly moved its disaster loan division into Kansas City to handle financial risks that couldn't be taken by the banks (in many hardship cases, financial credit is the Number One problem). The Army Engineers established nine disaster-relief areas in the Kansas River Valley. And representatives of the Office of Defense Mobilization met with industry in Kansas City even before the waters had receded sufficiently to expose the full extent of damage to find out what was needed most to speed the rehabilitation of the stricken area.

• **Basic needs** revealed by preliminary reports disclosed an urgent need for such basic construction materials as steel, lumber, cement and brick. Manpower to meet requirements appears ample, but much hard-to-get operating equipment such as electric motors, generators, switch-gears, transformers and electric controls will be needed, necessitating high-priorities for their quick delivery.

Much information and many lessons are to be gained from the flood. Most obvious of these is that the narrow river channels in such localities as the Kansas Citys, Topeka, and other cities along the Kansas River cannot pass the huge quantities of water which significant storms require them to carry. Flood crests must be detained in such upstream reservoirs as the proposed Tuttle Creek reservoir, one of the key flood control structures, and one that has been held in abeyance for years due to opposition from some local interests. This is due to only one of 18 reservoirs and 15 local protection projects in the Kansas River Report now before Congress, as part of the Pick-Sloan Plan for development and protection of the Missouri River Basin.

• **Terracing shows limitations** and another lesson learned from the flood is the fallacy that soil conservation alone, with its contour plowing, terracing and farm ponds is effective in controlling floods. Soil conservation programs play an essential role in preserving the irreplaceable topsoil, but as flood control measures, their values are reduced to near zero when prolonged pre-flood rains thoroughly saturate the soil as was the case in this flood.

• **Right now** there is very general agreement that the present disaster, which flooded 2,000,000 acres of farm lands in Kansas and Missouri, and affected nearly a million persons, must not happen again. While concern over the current devastation still remains high, an aroused populace in the affected area can be expected to clamor for quick implementation and rapid execution of adequate flood-control works on the upper reaches of the Kansas River and its tributaries. But when business returns again to normal many will be lulled into a feeling that "it won't happen again." There could be a bigger flood next time.

• **Next time** the swollen Kansas begins to dump its heavy load into the Missouri, the flow of that great stream, which was carrying subnormal seasonal flow of 80,000 cfs when the flood flow from the Kansas River came along, may be carrying its normal summertime flow of 150,000 cfs at Kansas City, or even an abnormal flood flow. Such a possibility as this is in the back of the minds of the engineers and contractors who know the vagaries of the Kansas and Missouri Rivers as they go about their current task of cleaning up. They wonder whether they will have to do it all again some day or whether this time the same kind of teamwork that is producing such fast results in clearing up after the flood can be made equally effective in getting construction of needed reservoirs authorized and financed.

DAMAGED CEILINGS were no uncommon sight following recession of the waters. Damage to this home property is examined by Red Cross.

ANOTHER BREAK IN THE DIKE!

Tough words to hear when you're battling a river on a rampage. But that's what happened during the recent disastrous floods on the Fraser River in British Columbia.

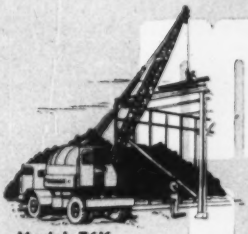
Perhaps you don't have to keep "rivers caged up," but that's an important job for Fraser River Pile Driving Co., Ltd. and their experience *again proves* the unusual mobility and handling ease of MICHIGAN cranes.

Says K. A. Matheson of the above company, "In the City of Mission on the Fraser River, the MICHIGAN cranes did a splendid job owing to their mobility and being able to get from one break in the dikes to another in very short order. In particular the TLDT-20 with remote control was a decided advantage, as it enabled us to do the same work with one less man when labor of this sort was badly needed on other flood-fighting work."

Regardless of your type of work, when you need an excavator-crane . . . investigate MICHIGAN . . . you'll agree it's your best buy!

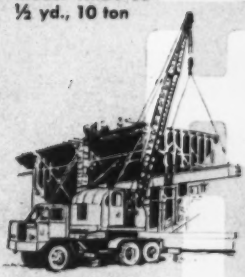
MICHIGAN POWER SHOVEL COMPANY

500 Second Street, Benton Harbor, Michigan, U. S. A.



Model T6K
⅜ yd., 6 ton

Model TMDT-16
½ yd., 10 ton



Model TLDT-20
12 ton

Series 8
½ yd., 8 ton

Model C-16
½ yd., 8 ton

How to make duck soup out of mud and water

THIS Model C-7 Briscoe Ditcher breezes through mud-and-water ditching jobs just as handily as it does through soil or sand. One thing that helps make these tough jobs seem easy—Timken® tapered roller bearings in the wheels.

Timken bearings permit the use of highly effective closures that retain lubricants longer, keep out damaging mud, water and sand. Maintenance time and material costs are sharply reduced. Friction is virtually eliminated because of the true rolling motion and incredibly smooth surface finish of Timken tapered roller bearings. Due to their tapered design, Timken bearings take radial and thrust loads in any combination. Line contact between the rollers and races gives them exceptional load-carrying capacity. Wear on moving parts is reduced to a minimum.

First choice throughout industry, Timken bearings are backed by more than half a century of bearing research and development. Whether you build or buy any type of machinery, specify Timken bearings. And look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

I. V. BRISCOE AND SON make certain this Briscoe Model C-7 Ditcher has a long life, gives trouble-free performance. All four wheels are mounted on Timken tapered roller bearings.

DESIGN LEADERSHIP

The first Timken tapered roller bearing was produced in 1898. Since then the one-piece multiple perforated cage, wide area contact between roll ends and ribs, and every other important tapered roller bearing improvement have been introduced by The Timken Roller Bearing Company.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

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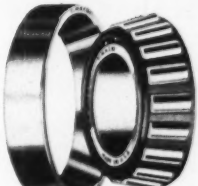
TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION